C21.5: 972/4

Vol. 972 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 25, 1978

RECEIVED
MIAMI UNIVERSITY
LIBRARIES
AUG - 7 1978
DEPOSITORY
DOCUMENTS DEPARTMENT

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 25, 1978 Volume 972 Number 4

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty Information	972 OG 20
Reissue Applications Filed	972 OG 20
Patent Notices	
Certificates of Correction for the Week of July 25, 1978	972 OG 21
Disclaimers	972 OG 21
Patents Available for Licensing or Sale	972 OG 21
National Technical Information Service	972 OG 22
Condition of Patent Applications	972 OG 23
Reissue Patents Granted (29,706)	1347
Plant Patents Granted (4,283)	1351
Patents Granted	
General and Mechanical (4,101,979)	1353
Chemical (4,102,639)	1573
Electrical (4,103,099)	1701
Design Patents Granted (248,596)	1787
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 48
Classification of	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 54
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 57
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 28,801, Re. S.N. 902,766, Filed May 3, 1978, Cl. 356/201, APPARATUS FOR EVALUATION OF BIOLOGICAL FLUID, Jesse L. Acker, et al., Owner of Record: *Inventors,* Attorney or Agent: James W. Badie, Ex. Gp.: 257

3,483,121, Re. S.N. 901,284, Filed Apr. 28, 1978, Cl. 252/8.55 R, FORMATION FRACTURING, Wesley A. Jordan, Owner of Record: *General Mills Chemicals, Inc., Minneapolis, Minn.,* Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 223

3,764,978, Re. S.N. 912,277, Filed Jun. 5, 1978, Cl. 340/146.3 D, COMBINED MAGNETIC OPTICAL CHARACTER READER, Robert M. Tyburski, et al., Owner of Record: *Optical Recognition Systems, Inc., Reston, Va.,* Attorney or Agent: Joseph A. DeGrandi, et al., Ex. Gp.: 237

3,781,169, Re. S.N. 907,785, Filed May 19, 1978, Cl. 8/34, DISPERSING AND STABILIZING AGENTS FOR DYESTUFFS, Reinhold Deubel, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt, Germany,* Attorney or Agent: Henry W. Koster, et al., Ex. Gp.: 141

3,835,410, Re. S.N. 901,766, Filed May 1, 1978, Cl. 330/19, CURRENT AMPLIFIER, Harold Allen Wittlinger, Owner of Record: *Inventor,* Attorney or Agent: Harold Christoffersen, Ex. Gp.: 252

3,885,506, Re. S.N. 906,799, Filed May 17, 1978, Cl. 105/367, RAILROAD CAR WITH DEPRESSED FLOOR, William D. Mundinger, et al., Owner of Record: *Pullman Incorporated, Chicago, Ill.,* Attorney or Agent: Richard J. Myers, et al., Ex. Gp.: 314

4,044,474, Re. S.N. 904,940, Filed May 11, 1978, Cl. 34/86, ANIMAL DRYER, Edwin R. Greene, et al., Owner of Record: *Inventors,* Attorney or Agent: Theodore J. Bielen, Jr., et al., Ex. Gp.: 344

4,079,866, Re. S.N. 911,178, Filed May 31, 1978, Cl. 222/335, LUBRICANT METERING VALVE IN LUBRICATING SYSTEMS, Zeo Asioli, Owner of Record: *Inventor,* Attorney or Agent: Alvin Browdy, et al., Ex. Gp.: 311

PATENT NOTICES

Certificates of Correction for the Week of July 25, 1978

3,803,135	4,053,143	4,069,368	4,075,813
3,956,043	4,053,238	4,069,591	4,076,486
4,009,934	4,054,610	4,069,772	4,076,500
4,012,485	4,054,718	4,069,822	4,076,733
4,014,351	4,056,622	4,069,923	4,076,842
4,014,359	4,057,741	4,069,993	4,077,418
4,014,931	4,058,523	4,070,163	4,078,779
4,020,212	4,061,025	4,071,017	4,079,864
4,023,571	4,061,933	4,071,053	4,080,142
4,029,460	4,062,830	4,071,955	4,080,575
4,034,652	4,063,244	4,072,098	4,081,707
4,038,309	4,064,160	4,072,315	4,081,830
4,038,742	4,065,069	4,072,701	4,082,125
4,040,702	4,065,537	4,073,092	4,082,127
4,041,951	4,066,999	4,073,106	4,082,359
4,043,843	4,067,078	4,073,230	4,082,597
4,043,891	4,067,183	4,073,603	4,082,773
4,046,604	4,067,261	4,074,344	4,082,832
4,047,965	4,067,861	4,074,408	4,082,917
4,049,585	4,068,876	4,075,330	4,083,059
4,053,140	4,069,206	4,075,575	

Disclaimers

3,950,512.—*Jerrell Bemis Emery*, Chalfont, and *James Long Bittle*, Doylestown, Pa. ANIMAL VACCINES. Patent dated Apr. 13, 1976. Disclaimer filed May 9, 1978, by the assignee, *Pitman-Moore, Incorporated.*

Hereby enters this disclaimer to claims 2, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20 and 21 of said patent.

4,018,726.—*Andrew V. Schally*, Metairie, and *David H. Coy*. New Orleans, La. (D-PHE6)-LH-RH AND INTERMEDIATES THEREFOR. Patent dated Apr. 19, 1977. Disclaimer filed May 26, 1978, by the assignee, *The Administrators of The Tulane University Educational Fund.*

Hereby enters this disclaimer to all seven claims of said patent.

4,083,824.—*Thomas G. Harris*, Lancaster, Pa. NON-VINYL SURFACE COVERING COMPOSITION. Patent dated Apr. 11, 1978. Disclaimer filed May 30, 1978, by the assignee, *Armstrong Cork Company.*

Hereby enters this disclaimer to claims 1 to 8 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUTDOOR-ILLUMINATED SIGN. John Finnerty, 251 De Grande Ave., Teaneck, N.J. 07666.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 N. Lake Shore Drive, 14-M, Chicago, Ill. 60610.

4,056,897. PLANTER DESIGN AND CONSTRUCTION. Mary Ellen Pearce; John Scott. Correspondence to: E. Barron Batchelder, Sixbey, Friedman & Leedom, P. C., Suite 206, 2001 Jefferson Davis Hwy., Arlington, Va. 22202.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,086,026. WINDMILL WITH RADIAL VANES. Robert J. Tamanini, 4 Pinewood Road, Wyomissing, Pa. 19610.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,578,840. REVOLVING REFLECTOR.

3,835,507. ROPE HOLDING DEVICE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,087,281. METHOD OF PRODUCING OPTICAL IMAGE ON CHROMIUM OR ALUMINUM FILM WITH HIGH-ENERGY LIGHT BEAM.

4,087,626. SCRAMBLER AND UNSCRAMBLER FOR SERIAL DATA.

4,088,406. METHOD OF PERFORMING CONTACTLESS PHOTOLITHOGRAPHY.

4,088,510. MAGNESIUM OXIDE DYNODE AND METHOD OF PREPARATION.

4,088,867. CREATING A CLOSED IMAGE FROM SEGMENTS.

4,088,920. FLAT DISPLAY DEVICE WITH BEAM GUIDE.

4,088,931. PINCUSHION CORRECTION CIRCUIT.

4,088,941. VOLTAGE REFERENCE CIRCUITS.

4,088,942. FERRORESONANT TRANSFORMER STRUCTURE.

4,088,947. ELECTRICAL CONTINUITY TEST APPARATUS HAVING A FORWARD BIASED DIODE ACROSS THE TEST TERMINALS.

4,088,968. FREQUENCY LINEARIZATION AND SENSITIVITY EQUALIZATION OF A FREQUENCY MODULATED CRYSTAL OSCILLATOR.

4,089,687. PHOTOGRAPHIC METHOD FOR PRINTING PARTICLE PATTERN WITH IMPROVED ADHERENCE UTILIZING VANADATES.

4,090,095. CHARGE COUPLED DEVICE WITH DIODE RESET FOR FLOATING GATE OUTPUT.

4,090,139. COMPLEMENTARY SYMMETRY FET MIXER CIRCUITS.

4,090,153. SURFACE ACOUSTIC WAVE ABSORBER.

4,090,204. ELECTRONICALLY STEERED ANTENNA SYSTEM USING A REFLECTIVE SURFACE FORMED OF PIEZOELECTRIC TRANSDUCERS.

4,090,238. PRIORITY VECTORED INTERRUPT USING DIRECT MEMORY ACCESS.

4,090,758. METHOD OF REGENERATING A LEAD MONOXIDE TARGET LAYER OF A CAMERA TUBE.

4,090,777. METHOD OF ALIGNING OPTICAL FIBERS WITH LIGHT EMITTING OPTICAL DEVICES.

4,090,851. S13N4 COATED CRUCIBLE AND DIE MEANS FOR GROWING SINGLE CRYSTALLINE SILICON SHEETS.

4,090,915. FORMING PATTERNED POLYCRYSTALLINE SILICON.

4,091,144. ARTICLE WITH ELECTRICALLY-RESISTIVE GLAZE FOR USE IN HIGH-ELECTRIC FIELDS AND METHOD OF MAKING SAME.

4,091,334. CONNECTION OF A PLURALITY OF DEVICES TO A CIRCULAR WAVEGUIDE.

4,091,337. COAXIAL CAVITY MICROWAVE OSCILLATOR WITH MANUALLY ADJUSTABLE CAPACITIVE FEEDBACK ELEMENT.

4,091,347. CONVERGENCE APPARATUS FOR IN-LINE BEAMS.

4,091,387. BEAM FORMING NETWORK.

4,091,406. COMBINATION GLASS/LOW TEMPERATURE DEPOSITED SIWNXHYOZ PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR SEMICONDUCTOR DEVICES.

4,091,407. COMBINATION GLASS/LOW TEMPERATURE DEPOSITED SIWNXHYOZ PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR A SEMICONDUCTOR DEVICE.

4,091,409. SEMICONDUCTOR DEVICE HAVING SYMMETRICAL CURRENT DISTRIBUTION.

4,091,430. GUARD CIRCUIT FOR HIGH IMPEDANCE SIGNAL CIRCUITS.

4,091,527. METHOD FOR ADJUSTING THE LEAKAGE CURRENT OF SILICON-ON-SAPPHIRE INSULATED GATE FIELD EFFECT TRANSISTORS.

4,091,847. PROCESS FOR FILLING DYNAMIC SCATTERING LIQUID CRYSTAL CELLS.

4,092,209. SILICON IMPLANTED AND BOMBARDED WITH PHOSPHORUS IONS.

4,092,561. STRIPE CONTACT PROVIDING A UNIFORM CURRENT DENSITY.

4,092,609. CIRCUIT FOR REDUCING RIPPLE VOLTAGE.

4,092,612. AMPLIFIER CIRCUITS.

4,092,659. MULTI-LAYER REFLECTOR FOR ELECTRO-LUMINESCENT DEVICE.

4,092,672. MASTER OSCILLATOR SYNCHRONIZING SYSTEM.

4,092,728. PARALLEL ACCESS MEMORY SYSTEM.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent-application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements & Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782.

Patent application 860,275. Synchronization of Blades for Rotary Slash Cutters. Dec. 13, 1977.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St., SW.,
Washington, D.C. 20590

Patent application 883,222. Rail Car Identification Apparatus. Filed Mar. 13, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 855,384. Fiber Optic pH Probe. Filed Nov. 28, 1977.

Patent application 859,079. System for Obtaining Displacement-Amplitude Information from a Quadrature-Dual Interferometer. Filed Dec. 9, 1977.

Patent application 865,712. Portable Ultrasonic Measurement System. Filed Dec. 29, 1977.

Patent application 870,090. Cerebrospinal Fluid Protein Fragments. Filed Jan. 17, 1978.

Patent application 877,379. System for Multifunctional Control of Upper Limb Prosthesis via EMG Signal Identification. Filed Feb. 13, 1978.

Patent 4,040,905. Sub-Human Primate Diploid Cell Lines as Substrates for Virus Vaccine Production. Filed Oct. 27, 1971. Patented Aug. 9, 1977. Not available NTIS.

Patent 4,048,016. Identification of Non-Fermentative Gram-Negative Bacteria. Filed Apr. 25, 1975. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,058,602. Synthesis, Structure, and Antitumor Activity of 5,6-Dihydro-5-Azacytidine. Filed Aug. 9, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,066,405. Method for Total Protein Fractionation and Analysis of Human Saliva. Filed Oct. 4, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,066,506. Method of Separating and Purifying Two Active Forms of Urokinase Using Affinity Chromatography. Filed Oct. 8, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,068,127. X-Ray Generating Apparatus Comprising Means for Rotating the Filament. Filed July 8, 1976. Patented Jan. 10, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent 4,053,302. Synthetic Fluorspar for Conditioning Electric Furnace Slags. Filed Mar. 11, 1977. Patented Oct. 11, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 873,745. Sequential Probability Ratio Test for Friend Identification Systems. Filed Jan. 30, 1978.

Patent 4,039,833. High Density Infrared Detector Array. Filed Aug. 17, 1976. Patented Aug. 2, 1977. Not available NTIS.

NATIONAL AERONAUTICS & SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 837,794. Atomic Hydrogen Storage Method and Apparatus. Filed Sept. 29, 1977.

Patent application 858,769. Microwave Power Converter. Filed Dec. 8, 1977.

Patent application 861,391. Method and Apparatus for Measuring Minority Carrier Lifetimes and Bulk Diffusion Length in p-N Junction Solar Cells. Filed Dec. 16, 1977.

Patent application 861,392. Resolution Enhanced Sound Detecting Apparatus. Filed Dec. 16, 1977.

Patent application 880,725. An Annular Wing. Filed Feb. 24, 1978.

Patent application 880,838. Shock Isolator for Operating a Diode Laser and Closed-Cycle Refrigerator. Filed Feb. 24, 1978.

Patent application 885,061. End Effector Device. Filed Mar. 9, 1978.

Patent application 885,066. A Portable Device Particularly Suited for Use in Starting Air-Start Units for Aircraft. Filed Mar. 9, 1978.

Patent 4,055,072. Apparatus for Measuring a Sorbate Dispersed in a Fluid Stream. Filed Sept. 19, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,707. Selective Coating for Solar Panels. Filed Dec. 22, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,072,532. High Temperature Resistant Cermet and Ceramic Compositions. Filed Nov. 20, 1975. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,075,057. Non-Equilibrium Radiation Nuclear Reactor. Filed Mar. 21, 1975. Patented Feb. 21, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 1, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides: Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-17-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-13-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-22-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-15-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors: Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-31-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents..... Numbers 2,067 to 2,075, inclusive

REISSUES

JULY 25, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,706

HOSIERY SUPPORT

Kurt Ernst Findeisen, Spring City, Pa., assignor to Findeisen Brothers, Spring City, Pa.

Original No. 3,965,702, dated Jun. 29, 1976, Ser. No. 413,677, Nov. 7, 1973. Application for reissue Jun. 16, 1977, Ser. No. 807,042

Int. Cl.[2] D04B *9/54;* A41B *11/00*

U.S. Cl. 66—173 2 Claims

1. In a self-sustaining stocking having an elastic yarn knit in selected courses at its open end and having a small welt of double fabric at said end with a natural tendency to roll downwardly on a wearer, a flexible resilient stay positioned within the double fabric of the welt, said stay being of a length which is less than 25% of the *fully extended* circumference of the said welt, said stay being unrestrained within the confines of the said welt such that [is] *it* may migrate circumferentially thereof, said stay preventing circumferentially complete downward rolling of the welt on the wearer.

Re. 29,707

PRODUCT PRESSURIZED AIR DISPENSER HAVING IMPROVED PRODUCT CONTROL VALVE ACTUATOR

Herbert H. Loeffler, 53 Spy Pond La., Arlington, Mass. 02174

Original No. 3,979,027, dated Sep. 7, 1976, Ser. No. 615,087, Sep. 19, 1975. Continuation-in-part of Ser. No. 520,946, Nov. 4, 1974, Pat. No. 3,910,465. Application for reissue May 19, 1977, Ser. No. 798,498

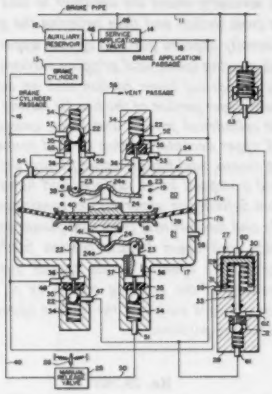
Int. Cl.[2] B67D *5/54*

U.S. Cl. 222—193 5 Claims

1. In a dispenser for dispensing a fine spray by means of compressed air and having a body having a dispensing nozzle means therein for mixing and dispensing a fluent product and compressed air, a piston-cylinder means depending from said body and having a fixed member in said body and a movable member movable relative to said fixed member for compressing air therebetween, said fixed member having a fluent product containing recess therein opening toward said movable member, a product pressurizing piston in said product containing recess having an end exposed toward said movable member, said body having a product flow path therethrough from said product containing recess to said nozzle means and a product control valve means in said product flow path for controlling flow of product therethrough, and said body further having a compressed air flow path therethrough to said nozzle means and compressed air valve means in said compressed air flow path which is opened near the end of the movement of said movable means for releasing compressed air at a predetermined pressure into said compressed air flow path, the improvement comprising:

a product valve actuator having an actuator element coupled to said product valve, a flexible diaphragm extending outwardly from said actuator element and sealing means on the periphery of said diaphragm fixed in sealing engagement to said body, said compressed air flow path opening beneath said diaphragm and said product valve actuator being movable in response to the pressure of the compressed air for opening said product valve,

whereby when the movable member is moved toward the fixed member for compressing air, the compressed air acts on said product pressurizing piston for pressurizing the product, the compressed air at a predetermined pressure is released to said flow path, said valve actuator is moved to open said product valve.



Re. 29,708

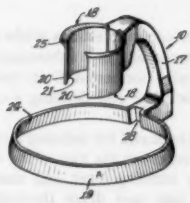
DECANTER HANDLE STRUCTURE

Norman H. Schlegel, Chicago, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Original No. 3,717,288, dated Feb. 20, 1973, Ser. No. 126,853, Mar. 22, 1971. Application for reissue Nov. 11, 1976, Ser. No. 740,831

Int. Cl.[2] A47B *95/02*

U.S. Cl. 222—465 1 Claim



23. For use with a glass decanter having a globular bowl portion terminating in an upper distal outturned portion defining a pouring spout, a handle structure comprising a one-piece element

defining a handle adapted to be grasped for manually carrying the decanter, a pair of arcuate gripping means having connecting portions fixedly connected to a common fixed upper portion of the handle and defining deflectible gripping portions spaced apart forwardly of said handle upper portion and extending at least approximately 270° whereby said gripping means is adapted for yieldingly firmly embracing the decanter subjacent said pouring spout, and an annular band extending in a continuous arc from a lower portion of the handle and having a large diameter preselected to embrace and protect the bowl portion of a decanter at the portion thereof having largest horizontal cross section for cooperating with said gripping elements in stabilizing the handle in retained association with the decanter, said element being formed of a material having limited resilience, the opening of said annular band being unobstructed axially thereof whereby said handle structure is mountable on said decanter by firstly moving said annular band vertically about the decanter to said decanter portion of largest cross section and then swinging the gripping means to embrace laterally opposed portions of said upper decanter portion below said pouring spout, said gripping portions each defining a segmentally cylindrical lower portion and an outturned upper end portion, said upper portion of the handle having a height equal to that of said cylindrical portion and being spaced radially outwardly of said upper decanter portion by said connecting portions of the gripping means, said handle upper portion defining a planar top surface and a stepped lower surface, said handle including a grasping portion defining an upper surface continuing uninterruptedly outwardly and downwardly from said planar top surface, said grasping portion and upper handle portion further defining a U-shaped downwardly opening recess spaced outwardly of the connecting portions of the gripping means by at least approximately half the outward extent of the handle upper portion away from said connecting portions.

Re. 29,709

APPARATUS FOR COOLING CASTINGS AND FOR COOLING AND DRYING MOULDING SAND

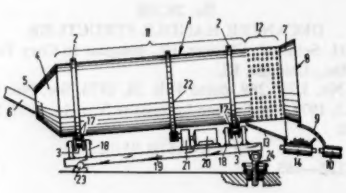
Herbert Vissers, deceased, late of Nieuw-Vennep, Netherlands by Hermanus H. Vissers, assignor to Expert, N.V., Curacao, Netherlands Antilles

Original No. 3,942,644, dated Mar. 9, 1976, Ser. No. 401,282, Sep. 27, 1973. Application for reissue Aug. 16, 1976, Ser. No. 714,675

Claims priority, application Netherlands, Sep. 29, 1972, 7213261

Int. Cl.[2] **B07B** *1/15*

U.S. Cl. 209—86 **9 Claims**



1. An apparatus for cooling castings while cooling and drying molding sand, comprising in combination:

an elongate, generally horizontal drum having an inlet end and an open discharge end defining a casting discharge mouth;

wall means at said inlet end for defining a restricted opening centered with respect to the axis of the drum, and means for feeding the molding sand and casting contents of molding flasks into said drum through said restricted opening;

said drum including an imperforate section leading from said wall means to adjacent the discharge end of said drum and including at least a terminal region nearest said discharge end which is of frusto-conical section which narrows toward said discharge end;

said drum also having a perforate section leading from said frusto-conical terminal region of the imperforate section, whereby to discharge sand from said drum before reaching said discharge end of the drum; and

means for selectively elevating the discharge end of the drum relative to its inlet end whereby to alter the inclination of said frusto-conical terminal region and thereby alter the residence time of the material passing through the drum.

Re. 29,710

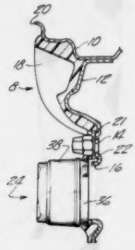
WHEEL AND GREASE CAP ASSEMBLY

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Original No. 3,998,494, dated Dec. 21, 1976, Ser. No. 560,997, Mar. 21, 1975. Application for reissue Apr. 28, 1977, Ser. No. 792,031

Int. Cl.[2] **B60B** *7/00*

U.S. Cl. 301—37 P **3 Claims**



1. A wheel and grease cap assembly including a metal wheel having wheel mounting holes arranged on an annular circle and a plastic member attached to and covering the wheel, said plastic member having a portion extending radially inward of said circle and between said mounting holes and having an inner annular surface adjacent said circle, an annular groove formed in said inner annular surface and having a radially inward facing bottom portion, a cap attached to said plastic member and having [a retaining ring] *an annular flange portion* axially extending inside of said inner annular surface of said plastic member, said cap having a plurality of circumferentially spaced attaching portions formed on said [retaining ring] *annular flange portion* and located in said annular groove, said attaching portions being deflectable relative to said cap for resiliently restraining removal of said cap from said plastic member, said attaching portions presenting outer radius portions engageable with said bottom portion of said annular groove to retard relative rotation of said cap and said wheel, said annular groove being formed of segments with one segment extending between adjacent mounting holes of said wheel, a cam surface formed in said plastic member circumferentially adjacent to opposite ends of each of said segments of said groove and at the exterior thereof to engage and simultaneously deflect said grease cap relative to said wheel during attachment of said grease cap to said wheel.

Re. 29,711

POLYUREAS AND PREPARATION THEREOF

Louis L. Wood, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Original No. 3,892,696, dated Jul. 1, 1975, Ser. No. 252,793, May 12, 1972. Continuation of Ser. No. 670,602, Mar. 26, 1976, abandoned. Application for reissue Jan. 4, 1977, Ser. No. 756,924

Int. Cl.[2] **C08G** *22/00, 51/34*

U.S. Cl. 260—29.2 TN **11 Claims**

1. A method for preparing aqueous polyurea solution which

consists essentially of preparing a non-crosslinked polyurea by reacting a first component comprising *a poly(oxyalkylene) polyol capped with polyisocyanate, said* polyisocyanate selected from the group consisting of polyaryl polyisocyanate, tolylene diisocyanate, triphenylmethane-4,4'4'',-triisocyanate, benzene-1,3,5-triisocyanate, toluene-2,4,6-triisocyanate, diphenyl-2,4,4'-triisocyanate, hexamethylene diisocyanate, xylylene diisocyanate, chlorophenylene diisocyanate, diphenylmethane-4,4'-diisocyanate, naphthalene-1,5-diisocyanate, xylene-alpha,alpha'-diisothiocyanate, 3,3'-dimethyl-4,4'-biphenylene diisocyanate, 3,3'-dimethoxy-4,4'biphenylene diisocyanate, 2,2',5,5'-tetramethyl-4,4'-biphenylene diisocyanate, 4,4'-methylenebis (phenylisocyanate)c 4,4'-sulfonylbis (phenylisocyanate), 4,4'-methylene di-orthotolylisocyanate, ethylene diisocyanate, ethylene diisothiocyanate, trimethylenediisocyanate and the like; and a second component comprising polyamine having from about 2 to about 23 pendant amine groups in a non-protonic carbonyl containing solvent selected from the group consisting of acetone, methyl ethyl ketone, cyclohexanone, acetaldehyde, propionaldehyde, butyradelhyde, and isobutyraldehyde; said polyamine and said solvent being first combined for from about 2 minutes to about 24 hours at temperature of −5° C. to about 150° C.; the molar ratio of isocyanate groups in the polyisocyanate to amine groups in the polyamine being from about 1:1 to about 1:20 isocyanate to amine; adding water and removing the solvent from the non-crosslinked polyurea.

PLANT PATENTS

GRANTED JULY 25, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,283
ROSE PLANT

Robert V. Lindquist, Sr., Hemet, Calif., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 11, 1977, Ser. No. 850,813
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class substantially as herein shown and described, characterized particularly as to novelty by (1) blooms which display a very wide spectrum of color ranging from bright yellow at the center through near white to deep rose at the petal margins, and (2) highly glossy foliage.

4,284
HYBRID TEA ROSE PLANT

Robert V. Lindquist, Sr., Hemet, Calif., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 10, 1977, Ser. No. 850,402
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class substantially as herein shown and described, characterized particularly as to novelty by (1) blooms which display a spectrum of red shades ranging from a lighter hue at the petal base to a vibrant watermelon red on the petal edge which is particularly dramatic under sunny skies, and (2) a vigorous and erect growth habit.

4,285
CHERRY PLUM BUSH

LeRoy I. Moling, Rte. 3, Fergus Falls, Minn. 56537

Filed Mar. 25, 1977, Ser. No. 781,333
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. I claim a new and distinctive variety of a Cherry-Plum Bush substantially as herein shown and described characterized particularly as to novelty by the unique combination of a relatively short widespread growth of a bush having tough flexible stems and branches, able to bear a heavy fruit load and having fruit buds approximately every ¾ to ¾ inch along all of the stems and branches and a cluster of buds at the base of each branch, being very disease and insect resistant and able to withstand frigid temperatures without cover and having a rapid growth producing a first crop in the growing season following grafting, the fruit being substantially freestone, having a small pit and cavity and having a relatively thick, sweet, smooth, textured fruit; the variety — which resembles the "Sapalta" Cherry Plum — being distinctively characterized, in comparison, by fruit which has thicker flesh, a smaller pit, and by being almost free of astringency.

PATENTS

GRANTED JUL. 25, 1978

ERRATA

For CLASS	See PATENT NO.
029–25.42	4,102,021
037–104	4,102,066
075–124	4,102,225
096–114.1	4,102,312
173–137	4,102,534
296–102	4,102,537
432–003	4,102,632
062–344	4,102,660
055–002	4,102,661
427–191	4,102,678
362–071	4,102,712
521–174	4,102,828
521–081	4,102,829
521–165	4,102,830
521–099	4,102,831
521–103	4,102,832
521–159	4,102,833
528–046.518	4,102,860
528–088	4,102,862
528–111	4,102,863
528–173	4,102,864
528–215	4,102,865
528–135	4,102,866
528–289	4,102,867
427–178	4,102,869
528–073	4,102,870
528–324	4,102,871
528–362	4,102,872
528–331	4,102,873
528–387	4,102,874
528–388	4,102,875
526–019	4,102,876
544–283	4,102,885
423–579	4,102,950
423–594	4,102,951
424–001	4,102,979
428–155	4,103,002
415–212 R	4,103,063
528–487	4,103,074
260–175	4,103,092
361–086	4,103,181

PATENTS

GRANTED JULY 25, 1978

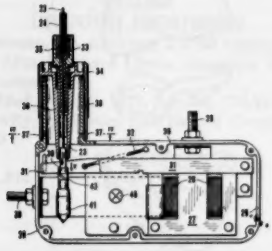
ERRATA

PATENTS

GRANTED JULY 25, 1978

GENERAL AND MECHANICAL

4,101,979
WELDING MASK WITH AUTOMATIC OBSCURING OF THE VISUAL FIELD
Eugenio Tarrone, Via Antonio Cecchi 3, I-10152 Torino, Italy
Filed Nov. 9, 1976, Ser. No. 740,209
Claims priority, application Italy, Dec. 16, 1975, 70094 A/75; Nov. 5, 1976, 69641 A/76
Int. Cl.[2] A61F *9/06*
U.S. Cl. 2—8 **4 Claims**



1. In a welding mask for carrying out arc welding, comprising an opaque shell, a vision window in said opaque shell, a movable frame having at least one obscured glass arranged in said vision window for displacement between a position of inactivity and a position of activity in which it obscures said vision window, a housing separate from said opaque shell, an actuation means arranged within said housing, a sheath connected at one end to said opaque shell and at the other end to said housing, and a flexible cable connected at one end to said movable frame and at the other end to said actuation means, said sheath and flexible cable forming a transmission means for displacing said movable frame under action of said actuation means;

the improvement that said actuation means comprises an electromagnet having an electric winding adapted to be connected to the electric circuit of an arc welding apparatus, and an anchor cooperable with said electromagnet,

and bayonet joint means inserted between said sheath and said housing as well as between said flexible cable and said anchor, whereby said housing with the actuation means can be connected and disconnected by a single operation to and from said transmission means and opaque shell.

4,101,980
PROTECTIVE DEVICE HAVING A SHIELD FOR PROTECTING THE FACE OF A USER
Walter Stepan, Allersberg, and Klaus Hennecke, Schwabach, both of Germany, assignors to UVEX Winter Optik GmbH, Furth, Bay, Germany
Filed Apr. 19, 1976, Ser. No. 678,135
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1975, 7513464[U]
Int. Cl.[2] A42B *1/08*; A61F *9/00*
U.S. Cl. 2—9 **10 Claims**

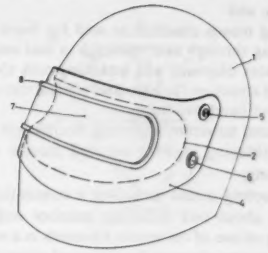
1. A face shielding, protective device for use by a user in connection with a safety helmet comprising, in combination:

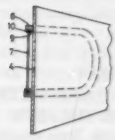
a contoured face shield of a flexible, transparent, shatterproof plastic, said shield having a front side which is to face away from the user;

means on said shield for movably attaching said shield to a helmet, said means for attaching defining a swivel axis;

a frame including a shoulder portion, said shoulder being affixed to said front side of said shield; and

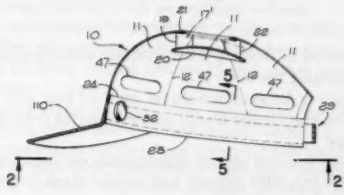
a guard made of scratch-resistant, mineral safety glass mounted in said frame, said guard being at least partially

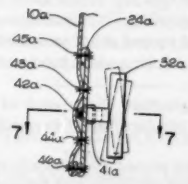




bent to conform to the contour of said shield and completely covering the field of vision of the user, and wherein said guard is mounted removably and interchangeably on said face shield.

4,101,981
VENTILATED HAT OR CAP
Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001
Filed Apr. 15, 1977, Ser. No. 787,839
Int. Cl.[2] A42B *1/00*
U.S. Cl. 2—182.6 **18 Claims**





7. A hat or cap comprising:

a crown structure adapted to extend across the top of a user's head and downwardly about the user's head;

a hat band structure at the bottom of said crown structure

and adapted to extend across the front of the head and rearwardly at its sides;

a plurality of spacer elements projecting inwardly from said hat band structure and adapted to engage the user's head in a relation holding the hat band structure in spaced relation thereto to allow for air circulation between the head and hat band structure;

said spacer elements having head contacting portions and having outer portions with openings extending therethrough; and

connecting means attached to said hat band structure and extending through said openings in said outer portions of said spacer elements and attaching said elements to said hat band structure for universal pivotal movement relative to the hat band structure;

said hat band structure including flexible hat band material and a stiffening member secured thereto and extending therealong;

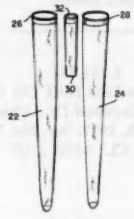
said connecting means including a connecting element extending about said stiffening member and through said opening of one of the spacer elements in a relation mounting the spacer element for universal pivotal movement.

4,101,982

PANTY HOSE GARMENT AND METHOD OF MANUFACTURE THEREOF

David Muller, 7053 Guelph, Cote St. Luc, Quebec, Canada

Filed Sep. 17, 1976, Ser. No. 725,094
Int. Cl.[2] A41B 9/04
U.S. Cl. 2—409 **10 Claims**



1. A method of forming a combination stocking-panty garment comprising the steps of:

a. forming a longitudinal slit in each of first and second circular knit tubular blanks intermediate the front and rear thereof;

b. forming first and second diametrically opposed longitudinal slits in a third circular knit tubular blank intermediate the front and rear thereof;

c. seaming the edge of the slit of said first tubular blank to the edge of the first slit of said third tubular blank and seaming the edge of the slit of said second tubular blank to the edge of said second slit of said third tubular blank.

6. A combination stocking-panty produced by the following steps:

a. forming a longitudinal slit in each of first and second circularly knit tubular blanks intermediate the front and rear thereof;

b. forming first and second diametrically opposed longitudinal slits in a third circularly knit tubular blank intermediate the front and rear thereof;

c. seaming the edge of the slit of said first tubular blank to the edge of the first slit of said third tubular blank and seaming the edge of the slit of said second tubular blank to the edge of said second slit of said third tubular blank.

4,101,983

ENVELOPING HELMET OF COMPOSITE STRUCTURE

Alain Dera, Rueil-Malmaison, and Marcel Goupy, Saint Cloud, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 3, 1977, Ser. No. 803,268
Claims priority, application France, Jun. 4, 1976, 76 17029; Jan. 19, 1977, 77 01392; Jan. 26, 1977, 77 02100
Int. Cl.[2] A42B 3/02
U.S. Cl. 2—412 **12 Claims**

1. A protective helmet, of composite structure, intended especially for riders of two-wheeled vehicles, the outer part thereof comprising an upper rigid shell obtained by injection of polycarbonates or ABS, or molding of stratified polyesters, and joined to a semi-rigid lower shell of plastic of the plastified PVC type or of injected thermoplastic polyurethane and having extensions over the regions of the ears, such being connected by gluing and/or riveting or clipping, and the interior shock absorbing part consisting of an upper rigid absorber of polystyrene foam of density between 15 and 20 g/dm^3 or a semi-rigid polyurethane foam of density between 30 and 120 g/dm^3, of hemispherical shape, and a lower absorber in the form of a semi-rigid sponge ring, e.g. of polyurethane foam.

4,101,984

CARDIOVASCULAR PROSTHETIC DEVICES AND IMPLANTS WITH POROUS SYSTEMS

David C. MacGregor, 81 Wimbleton Rd., Islington, Ontario, Canada

Filed May 5, 1976, Ser. No. 683,382
Claims priority, application Canada, May 9, 1975, 226993; United Kingdom, Dec. 22, 1975, 52474/75
Int. Cl.[2] A61F 1/22, 1/24
U.S. Cl. 3—1.5 **6 Claims**

1. A heart valve structure comprising an occluder, an occluder seating ring and occluder guide means, each of said occluder seating ring and occluder guide means being constructed of metal inert to blood and consisting of a dense rigid,

coherent metal substrate and a rigid porous metal coating adhered to at least a substantial portion of said substrate, said porous metal coating including a plurality of metal particles bonded together at their points of contact with each other and with said substrate to form a network of interconnected pores substantially uniformly distributed through the coating, said porous coating having a porosity of about 10 to about 50% and a thickness of about 20 to about 300 microns, said porous coating and the coating-substrate interface having a shear strength greater than about 1000 psi, the composite of said porous coating and substrate having a high fatigue tolerance, said metal particles having a particle size of −500 mesh.

4,101,985

HIP-JOINT PROSTHESIS

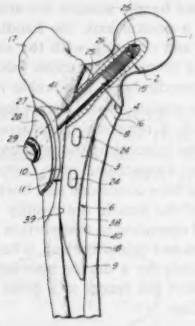
Friedrich Baumann, Am Kirchweg 2, 8580 Neuburg-Ried, Germany, and Max Bernhard Ulrich, Amselweg 55, 7900 Ulm (Donau), Germany

Filed Mar. 18, 1977, Ser. No. 778,931

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611985

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.912 **14 Claims**



1. A prosthesis comprising a ball head shaped to fit in an acetabulum, an elongated shaft shaped to fit in and between the two opposite sides of a medullary cavity of a femur, and a stem between and connecting said head to one end of said shaft, said shaft being curved in a plane and having a concave longitudinal edge and a convex longitudinal edge and said stem being inclined in said plane to the longitudinal axis of said shaft, said prosthesis being formed with:

a laterally projecting shoulder engageable against a sawed-off end of a femur in whose medullary cavity said shaft is to be engaged;

an inner engagement surface on said concave edge adjacent said shoulder and engageable with one of said sides of a medullary cavity of said femur;

an outer engagement surface on said concave edge at the other end of said shaft and engageable with said one side of a medullary cavity of said femur;

an intermediate engagement surface on said convex edge between said inner and outer engagement surfaces and generally parallel to said outer engagement surface, said intermediate engagement surface being engageable with the other side of a medullary cavity of said femur; and

a connecting surface to each longitudinal side of and inclined to each of said engagement surfaces and normally adapted to lie out of contact with the sides of said medullary cavity.

4,101,986

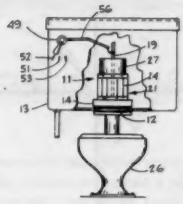
REGULATABLE FLUSH VALVE FOR TANK FLUSH TOILETS

Walter C. Ng, 2716 Pickfair La., Livermore, Calif. 94550, and Conrad A. Wilgus, 5506 Greenridge Rd., Castro Valley, Calif. 94546

Filed Jul. 29, 1977, Ser. No. 820,164

Int. Cl.² E03D *1/34*

U.S. Cl. 4—325 **11 Claims**



1. In a tank type flush toilet including a tank for containing a liquid flushing medium, a bowl for receiving waste materials, an outlet communicating between said tank and bowl and a pivoting handle and lever mechanism for lifting a valving element disposed in said outlet of said tank, a regulatable flush valve mechanism comprising in combination therewith,

a liquid vortex generating element secured coaxially above said outlet within said tank,

a cup element secured coaxially above said liquid vortex generating element having a bottom with a hole defined therethrough axially aligned with said outlet,

a valve element having a central passageway disposed coaxially within said vortex generating element adapted to plug said outlet,

an overflow tube having a lower end secured to and communicating with said central passageway of said valve element and extending upwardly therefrom through said hole defined in the bottom surface of said cup element to a point above said cup element, said overflow tube having an upper end secured to the lever of said pivoting handle and lever mechanism whereby said liquid flushing medium overflows into said tube,

a piston element coaxially secured to said overflow tube axially positioned within said cup element to provide in combination therewith an enclosed volume,

check valve means for permitting the liquid flushing medium to flow into and preventing said liquid from flowing out of said enclosed volume defined by said piston and cup elements,

regulating means for controlling flow of said liquid flushing medium out of said enclosed volume defined by said piston and cup elements whereby turning said handle of said handle and lever mechanism raises said overflow tube, piston element and valve element allowing the liquid flushing medium to flow from said tank through said vortex generating element out said outlet and into said bowl, the volume of liquid flowing from the tank being determined by the distance said valve element is raised above the outlet and by the rate at which said liquid flows from said enclosed volume.

4,101,987

DAMAGE PREVENTIVE DEVICE FOR SWIMMING POOLS

Real Gagnon, 5827-3rd Ave., Rosemont, Quebec, Canada

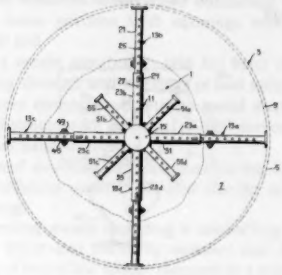
Filed Nov. 29, 1976, Ser. No. 745,971

Int. Cl.² E04H *3/16, 3/18*

U.S. Cl. 4—172 **3 Claims**

1. A device for preventing a thin walled swimming pool of the above-ground type, which contains water, from being damaged by floating ice masses in the fall or spring, which

device comprises a frame to be inserted into the water within the pool before the water freezes and after it gets too cold to use the pool, said frame comprising: a vertical post to be centrally positioned on the bottom of the pool, said post to become at least partially encased by the ice within the pool when the water freezes; a plurality of telescopic arms extending radially



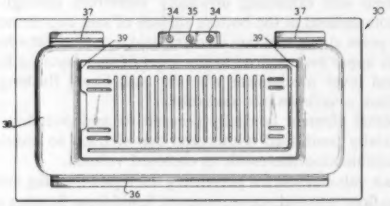
from the post toward the walls of the pool and means to adjust the length of said arms to bias the ends of said arms against the walls of the pool thereby immovably fixing the frame with respect to the walls of the pool to prevent ice masses from moving about in the pool and cause possible damage to the walls thereof.

4,101,988

BATHS

Stanley Leslie Sierant, Marlands, Cross Roads, Keighley, West Yorkshire, BD21 5QE, England

Filed Jun. 14, 1976, Ser. No. 695,898
Int. Cl.[2] A61H *9/00*; A47K *3/22*
U.S. Cl. 4—173 R **9 Claims**



1. A bath comprising a tub portion having a generally rectangular recess therein and a generally rectangular panel fitting snugly within said recess, said panel comprising:

(a) an upper sheet-like member forming an upper face of said panel and having first and second sets of a plurality of exit apertures passing therethrough;

(b) a lower sheet-like member sealed to said upper sheet-like member and forming the lower face of said panel;

(c) a plurality of ribs and recesses on at least one of said sheet-like members, said ribs and recesses cooperating with the other of said sheet-like members to define at least first and second passageways within said panel, said passageways being isolated from each other and said recesses forming said first and second passageways being in registration with said first and second sets of apertures respectively;

(d) a first inlet aperture in said lower sheet-like member and communicating with said first passageway; and

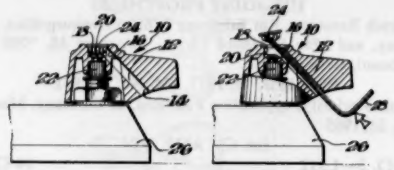
(e) a second inlet aperture in said lower sheet-like member and communicating with said second passageway; an air supply conduit extending from said first inlet aperture through the underside of said tub portion of said bath in sealed relationship therewith for directing air into said first passageway, distributing said air within said panel throughout said first passageway and projecting said air from the panel through said first set of exit apertures; and a water supply conduit extending from said second inlet aperture through the underside of said tub portion of said bath in sealed relationship therewith for directing water into said second passageway, distributing water within said panel throughout said second passageway and projecting said water from said panel through said second set of exit apertures.

4,101,989

VANDAL-PROOF FIXTURE HANDLE

Carmen J. Lagarelli, Clayton, Del., assignor to Speakman Company, Wilmington, Del.

Filed Sep. 16, 1976, Ser. No. 723,893
Int. Cl.[2] F16K *21/00*; E03C *1/04*
U.S. Cl. 4—191 **2 Claims**



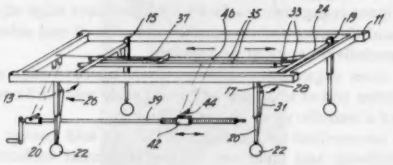
1. A vandal-proof handle suitable for attachment to a movable shaft having a central axis, the handle having a central bore surrounding and coacting with the axis of the shaft the axis of the shaft, a recess in the upper portion of the handle aligned with the handle bore, removable retaining means located in the lower portion of said recess for attachment of the handle to the shaft, a removable cap arranged in the upper portion of the recess concealing the retaining means from view of the handle user, a concealed bore through a handle at an angle to the handle bore concealed said bore extending from an external surface of the handle not readily visible to a handle user under normal operation to that portion of the recess above the retaining means and below the cap, whereby the cap can be readily removed only by a device inserted through the concealed bore and into the recess to a point underlying and in contact with the cap.

4,101,990

ADJUSTABLE HEIGHT BED

John Anthony Holland, Osborne Park, Australia, assignor to Avion Australia Pty Ltd., Osborne Park, Australia

Continuation of Ser. No. 594,494, Jul. 9, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,651
Claims priority, application Australia, Jul. 12, 1974, PB8188; Aug. 20, 1974, PB8595; Nov. 7, 1974, 75147/74
Int. Cl.[2] A61G *07/10*; A47C *20/04*
U.S. Cl. 5—63 **5 Claims**



1. A bed comprising a mattress supporting frame; two pairs of legs each rigidly mounted on the frame and being independent of the others; each leg having an upper portion and a lower portion, the upper portion being mounted on the frame and telescopically engaged by the lower portion; an operating

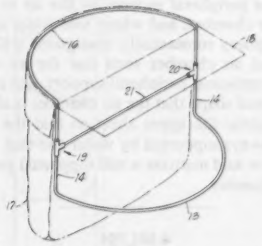
shaft associated with each pair of legs pivotably and transversely mounted in relation to the pair of legs; a pair of radial arms on each said operating shaft each being connected to the lower portion of one of said legs such that on application of a turning force on the operating shaft to effect turning thereof, the height of the frame above the floor can be varied; a drive means for selectively producing such turning, and counterbalance means mounted between the frame and the operating shafts to apply a rotary biassing force thereto, the biassing force applied to the operating shafts being sufficient to overcome the weight of the mattress-supporting frame and at least a portion of the weight of the occupant of the bed, said drive means comprising a screw threaded rod rotatably mounted on the mattress-supporting frame and means connecting the screw threaded rod and the operating shafts such that rotation of the screw threaded rod causes turning of the operating shafts, said means connecting the screw threaded rod and the operating shafts comprising a pair of linkage members for said shafts, and a pair of second radial arms mounted on each operating shaft and connected to a respective linkage member, said counterbalance means being substantially horizontally disposed and connected to said linkage members whereby the biassing force applied to each leg via said linkage members and radial arms is substantially constant and independent of the height of the frame above the floor.

4,101,991

ENEMA WASTE RECEPTACLE AND FRAME

Saverio Sandonato, 50 Evans St., New Hyde Park, N.Y. 11040

Filed Jan. 26, 1977, Ser. No. 762,404
Int. Cl.² A01G 9/02; A47C 21/00
U.S. Cl. 5—90 **4 Claims**



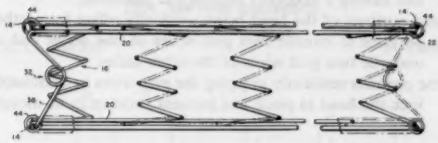
1. An attachment for a bed having a mattress and a mattress support means, the improvement comprising in combination, a frame and a flexible leakproof receptacle, having a lip, to permit a reclining patient to discharge wastes, said frame having a base portion projecting between the mattress and the mattress support means, a center section connected to said base portion, such that said center portion is perpendicular to said base portion and held flush against the side of the mattress when said base portion is inserted between the mattress and the mattress support means and an upper portion extending outwardly from said center portion, said upper portion being perpendicular to said center portion and parallel to said base portion and supporting said receptacle, such that said receptacle is held flush with the side of the mattress and generally level with the upper surface of the mattress, and holding its open end in an open position to receive wastes, said portion of the receptacle extending along the surface of the mattress is in the form of a lip.

4,101,992

SPRING ASSEMBLY WITH REINFORCEMENT

Alexander M. Levine, Boston, and Henry R. Ramsey, Dudley, both of Mass., assignors to Webster Spring Co. Inc., Oxford, Mass.

Filed Feb. 17, 1977, Ser. No. 769,460
Int. Cl.² F16F 3/00; A47C 23/02
U.S. Cl. 5—260 **10 Claims**



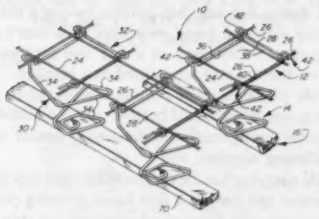
1. In a spring assembly including upper and lower border wires of rectangular configuration and a plurality of longitudinally spaced transversely extending rows of coils, said coils being connected at their upper and lower ends to the border wires and to each other; pairs of elongate stiffening elements disposed transversely of the assembly along the top and bottom ends of the coils in a row of coils, said stiffening elements being inextensible and affording resistance to deflection perependicular to the planes of the border wires and a torsion spring at one end of one element and at the other end of the other element situated between the border wires at the longitudinal sides, said torsion springs being resistant to compression perpendicular to the assembly, means connecting the torsion springs to the ends in laterally offset planes parallel to the elements and at distances therefrom so as to be situated in the spaces between rows of coils, means connecting each stiffening element to the transversely spaced border wires of the supporting surface in which it is situated and means connecting each torsion spring to the vertically spaced border wires at the longitudinal edges, said torsion springs being connected to the top and bottom border wires.

4,101,993

WIRE SPRING ASSEMBLY AND COMPONENTS

Chester Robert Yates, Carthage, Mo., and Guy E. Hall, Riverside, Calif., assignors to Steadley Company, Inc., Carthage, Mo.

Filed Feb. 22, 1977, Ser. No. 770,799
Int. Cl.² A47C 23/04
U.S. Cl. 5—267 **19 Claims**



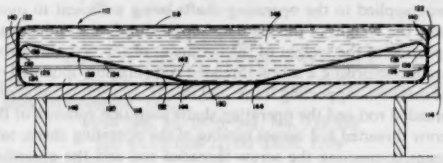
1. A wire spring assembly comprising:
a rectangular border frame having elongate side and end border members;
a first series of laterally spaced parallel grid wires extending between the end border members;
and a second series of laterally spaced parallel grid wires extending between the side border members and crossing the first series of wires at right angles thereto;
the two series of wires being fixedly connected at their ends to the border members and to each other at their crossing

points to define a substantially planar grid of lateral and longitudinal rows of adjacent rectangular openings;
and a plurality of resilient wire spring components, each formed of a single length of wire, detachably connected to and depending from the grid;
each component including vertically extensive spring body means and an attachment head;
the attachment head lying substantially in a horizontal plane and having a generally rectangular planform;
and portions of the head being vertically offset from other portions to overlie two grid wires of one series and to underlie two grid wires of the other series;
the portions resiliently gripping the grid wires to detachably lock the head in place and prevent rotation in its mounting.

4,101,994
COMBINATION BEACH BAG AND BLANKET
F. Russell Hoyt, 682 Azalea Dr., Rockville, Md. 20850
Filed Jul. 1, 1977, Ser. No. 812,247
Int. Cl.[2] A47G 9/00
U.S. Cl. 5—344 **5 Claims**

1. A combination beach bag and blanket construction comprising:
a. a rectangular openable and closeable bag portion having a stiffening member on one side thereof corresponding to the bottom side of the blanket when positioned on the ground during use, said bag portion having a bottom side and a top side and being receptive of a user's gear for holding same when used as a bag and for providing a pillow on the top side when used as a blanket;
b. a flexible planar blanket portion connected to said bag portion at one edge of said bottom side and foldable into a rectangular configuration of dimension similar to that of said stiffening member; and
c. a flexible carrying handle connected to said top side of the bag portion and having a first hand grasping portion extending outwardly from an edge of said top side disposed opposite said one edge and a second hand grasping portion positioned to lie on the blanket portion when unfolded and extendable around and engaging the folded blanket portion for juxtaposition with the first hand grasping portion, said first and said second hand grasping portions each having a U-shape and connected to one another to form a unitary closed loop shape comprising said carrying handle, whereby the folded blanket portion and the bag portion are maintained in side by side relationship having said first and said second hand grasping portions extending outwardly therefrom.

4,101,995
WATER BED MATTRESS
Raymond M. Phillips, 2566 S. Tuna Canyon Rd., Malibu, Calif. 90265
Continuation-in-part of Ser. No. 581,262, May 27, 1975, Pat. No. 4,006,501. This application Dec. 8, 1976, Ser. No. 748,707
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—371 **14 Claims**

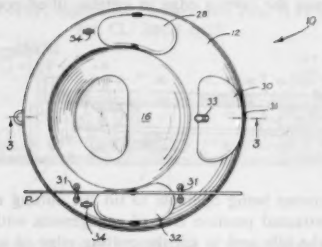


1. A water bed mattress for use in a rigid retaining frame and which mattress assumes its peripheral shape from said frame, said mattress comprising
(a) an upper sheet having a peripheral end margin,
(b) a lower sheet having a peripheral end margin and being in spaced apart relationship to said upper sheet,
(c) a peripherally extending side wall extending between and joined in operative relationship to said upper and lower sheets and forming a water chamber between said side wall and upper and lower sheets,
(d) and a peripherally extending panel forming an air chamber located in the corner portion where said side wall and said lower sheet are joined, said panel having one end extending inwardly from the peripheral end margin of said lower sheet and being secured to said lower sheet inwardly of its peripheral end margin, said panel having another end secured to said side wall or to the lower sheet in close proximity to the side wall so that said air chamber is bounded by at least said panel and said lower sheet, and said water chamber is bounded by at least said lower sheet, said panel, said upper sheet and a portion of said side wall, said air chamber, when filled with air, provides continuous peripheral support by the air to the water in said water chamber, and where said water chamber having a periphery substantially contiguous with the periphery of said air chamber such that the air chamber can provide continuous peripheral support, said panel being of such size and shape that the air chamber is always at least slightly below the upper sheet so that the entire upper sheet is always supported by water and that an individual reclining on said mattress is still supported peripherally by said air chamber.

4,101,996
FOOT PROPELLED WATER VEHICLE
Larry Gene Mikulecky, 530 Shorepines Ave., Coos Bay, Oreg. 97420
Filed Oct. 18, 1976, Ser. No. 733,056
Int. Cl.[2] B63C 9/08
U.S. Cl. 9—1.3 **3 Claims**

1. A foot propelled water vehicle comprising:
a hard-shelled body having a generally flat bottom, a generally circular periphery and curved sides, an upper surface curving from said sides inwardly to form a central V-shaped seating cavity, the space between said bottom and said upper surface defining the body interior, at least a portion of which is hollow,
said seating cavity being integrally formed with said body and defining a continuous surface having downwardly inclined front and rear portions, said front portion being inclined at an angle less with respect to the horizontal than said rear portion, said cavity being sized and positioned to accommodate a seated individual therein with the individual's feet extending over the side of said body adjacent

said front portion with the individual's weight substantially centered along the vehicle's central, vertical axis, and



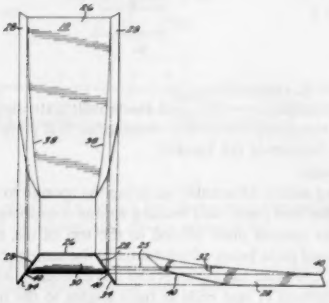
at least one opening provided on the periphery of said upper surface communicating with said hollow portion of said interior and being covered by an openable hatch cover permitting selective access to said interior.

4,101,997

WATER SKI FOR POWER DRIVEN WATER VEHICLE

Nelson Tyler, Van Nuys, Calif., assignor to Still Water Properties, N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 682,140, Apr. 30, 1976, abandoned.
This application Jul. 5, 1977, Ser. No. 812,780
Int. Cl.[2] A63C *15/00*
U.S. Cl. 9—310 A **4 Claims**



1. A water ski comprising:

an elongated central section having an underside defining a planing surface adapted to plane across the water at a predetermined acute trim angle relative to a horizontal plane corresponding to the water surface; and

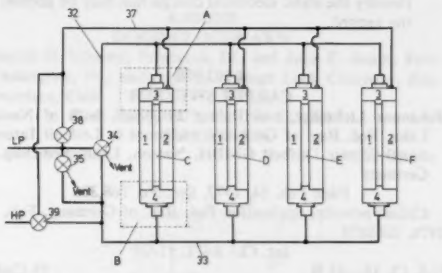
a pair of elongated side plates depending from said central section and having downwardly and laterally inclined inner side surfaces lying generally in a pair of planes intersecting above said planing surface, the pair of juncture lines between said pair of side surfaces and said planing surface being laterally divergent in a downstream direction when viewed from above, said side plates further having downwardly and laterally directed outer side surfaces, both said inner side surfaces and said outer side surfaces being adapted to be normally contacted by the water upon passage of said plates through the water.

4,101,998

BUOYANCY CONTROL APPARATUS FOR DIVERS

Brian Leonard Buckle, 16 Sunningdale Grove, Colwyn Heights, Colwyn Bay, Wales

Filed Apr. 13, 1977, Ser. No. 787,060
Claims priority, application United Kingdom, Apr. 14, 1976, 15284/76; Sep. 3, 1976, 36604/76
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.[2] B63C *9/16*
U.S. Cl. 9—316 **11 Claims**



1. In a buoyancy control apparatus for carrying by a diver comprising:

fluid-tight reservoir means;

water inlet valve means for admitting water to said reservoir from externally of the apparatus to displace gas from the reservoir;

gas outlet valve means for releasing said displaced gas from the reservoir to externally of the apparatus;

gas inlet valve means for admitting compressed gas to the reservoir to displace water from the reservoir; and

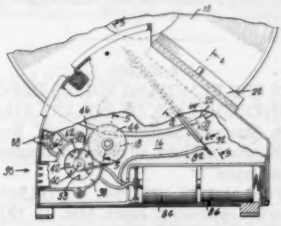
water outlet valve means for releasing said displaced water from the reservoir; whereby water and gas can be selectively admitted to the reservoir to displace gas and water respectively already in the reservoir thereby to change buoyancy of the apparatus, the improvement consisting in that said reservoir is comprised of a plurality of parallel longitudinally extending passageways.

4,101,999

BATTERY OPERATED DEVICE FOR CLEANING PHONOGRAPH RECORDS AND THE LIKE

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Jan. 12, 1977, Ser. No. 758,703
Int. Cl.[2] B08B *6/00*
U.S. Cl. 15—1.5 R **7 Claims**



1. A device for cleaning phonograph records comprising:

a housing enclosing a cleaning chamber and having an elongated record slot through which a record is at least partly inserted into the cleaning chamber;

means for supporting the part of the record inserted into the cleaning chamber and for rotating the record about its axis

so as to move successive parts of the record through the cleaning chamber;

means for causing an air flow impinging on the sides of the record part which is in the cleaning chamber, rather than on the record part which is outside of or at an entrance to the cleaning chamber, and thence exiting from the device, said air flow causing means including elongated air inlets in the housing which face the sides of a record inserted in the cleaning chamber; and

means for dissipating static electrical charge and means for supporting the dissipating means in electrical contact with the record part which is in the cleaning chamber to reduce thereby the static electrical charge that may be present on the record.

4,102,000
CARPET SWEEPER

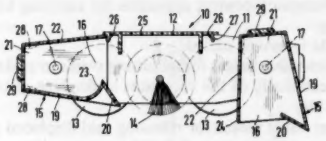
Johannes Liebscher, and Rainer Friedrich, both of Nassau, Lahn, Fed. Rep. of Germany, assignors to Leifheit International Günter Leifheit GMBH, Nassau, Lahn, Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,353

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605878

Int. Cl.[2] A47L *11/08*

U.S. Cl. 15—41 R **15 Claims**



1. A device for sweeping surfaces, particularly carpets and the like, comprising a housing having an open bottom; at least one brush mounted on said housing for rotation about an axis and operative for contacting a surface to be swept during movement of the device over such surface; means for rotating said brush about said axis so that dirt picked up by said brush from the surface being swept travels in a path; at least one dirt-collecting receptacle having an open end portion bounding all sides of an opening; means for pivotally mounting said dirt-collecting receptacle on said housing for movement between a filling position in which said open end portion and said opening are respectively located about and in said path for deposition of dirt in said receptacle, and a discharging position in which said open end portion of said receptacle projects downwardly from said housing through said open bottom thereof so that said opening is located out of said path for discharging deposited dirt from said receptacle; and means for locking said receptacle in said filling position, comprising cooperating locking portions on said housing and said receptacle, respectively.

4,102,001
APPARATUS FOR REMOVING SOLIDS DEPOSITED ON INNER SURFACE OF ROTARY KILN

Takashi Baba, Matsudo; Susumu Hunahashi, Ryugasaki, and Toshihiko Kawabata, Chiba, all of Japan, assignors to Kubota Ltd., Osaka, Japan

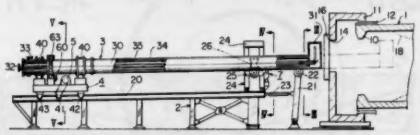
Filed Mar. 18, 1977, Ser. No. 778,960

Claims priority, application Japan, Mar. 18, 1976, 51-30638

Int. Cl.[2] B08B *9/08*

U.S. Cl. 15—104.1 C **5 Claims**

1. An apparatus for removing solids deposited on the inner surface of a rotary kiln including guide rails extending toward a burner hood of the kiln in parallel to the axis of the kiln, an elongated boring bar reciprocally movably supported by the guide rails and having a cutting edge projecting from its front end, and reciprocating means operatively connected to the boring bar to move the cutting edge along the wall of the kiln for the removal of the solid deposit, the apparatus comprising rotating means operatively connected to the boring bar for rotating the boring bar in positive and reverse directions to thereby turn the cutting edge to suitable tilted positions. the



rotating means being operable to tilt the cutting edge to an inward retracted position free of engagement with a tuyere dam on the kiln and to tilt the cutting edge to a projected position close to the kiln wall beyond the dam to cut the solid deposit on the kiln inner surface to a desired depth.

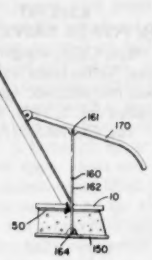
4,102,002
SELF-WRINGING MAP

Germaine T. Jones, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 20, 1977, Ser. No. 789,145

Int. Cl.[2] A47L *13/14, 13/257*

U.S. Cl. 15—119 A **2 Claims**



1. A mop, comprising

an elongated, upwardly and rearwardly extending handle;

a flat elongated horizontal rectangular first plate secured to the bottom of the handle;

a sponge;

locking means detachably securing the sponge to the bottom of the first plate, said locking means comprising a rectangular second plate affixed to the top of the sponge, the second plate being of substantially the same proportions as the first plate having ends and lips extending downwardly therefrom at said ends at right angles to the plane of the second plate, and a pair of lever actuated, pivoted hooks attached to a corresponding end of the first plate engaging the lips for detachably securing the second plate to the bottom of the first plate;

a pivot attached to the front of the handle above the first plate;

a lever attached at its lower end to the pivot and extending upwardly from the pivot along the handle, the lever being pivotable about the pivot in the plane defined by the handle and a vertical line;

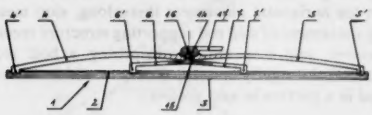
an elongated rectangular wringer plate having a center grill; and

a Y-shaped link member pivotally secured to the wringer plate and the lever in a manner whereby said wringer plate is pivotally secured between the ends of the legs of the Y and the tail of the Y is pivotally secured to the lever intermediate its ends.

4,102,003
WIPER BLADE STRUCTURE FOR VEHICLES

Théodore Hancu, Geneva, Switzerland, assignor to Societe d'Exploitation de Brevets J.B., Fribourg, Switzerland

Filed Dec. 30, 1976, Ser. No. 755,692
Claims priority, application Switzerland, Jan. 7, 1976, 90/76
Int. Cl.[2] B60S *1/02*
U.S. Cl. 15—250.42 1 Claim

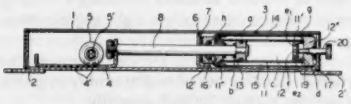


1. A windshield wiper comprising a wiper arm, a wiper blade structure pivoted to said wiper arm, said blade structure comprising a squeegee, a center bridge having two support arms connected to said squeegee at central regions thereof on opposite sides of the connection of the structure to the wiper arm, an outer bridge having two support arms connected to said squeegee at opposite ends thereof, said outer bridge comprising a unitary structure and being resiliently flexible along substantially its entire length, said center bridge having a projection and said outer bridge having an opening through which said projection extends, a portion of said projection on that side of the outer bridge opposite to the side upon which the center bridge is disposed, having a pivot hole, a pivot pin secured to said wiper arm and projecting into said pivot hole whereby adjacent portions of said wiper arm and center bridge constitute means holding said bridges together.

4,102,004
DOOR CLOSER

Toshiro Nagase, Sagamihara, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Feb. 7, 1977, Ser. No. 766,504
Claims priority, application Japan, Feb. 16, 1976, 51-16937[U]
Int. Cl.[2] E05F *3/00*
U.S. Cl. 16—49 5 Claims



1. A door closer or a device for controlling the opening or closing speed of a door, said device comprising:

a casing;

a dual tube hydraulic cylinder positioned within said casing, said cylinder including an inner tube located within an outer tube and fixedly positioned with respect thereto, there being an annular chamber defined between said inner and outer tubes;

a piston slidably positioned within said inner tube;

a piston rod extending through a first end of said cylinder, said piston rod having a first end fixed to said piston;

an actuating plate attached to a second end of said piston rod, said actuating plate having rack teeth thereon;

a pinion positioned in said casing in engagement with said rack teeth, said pinion adapted to be operatively connected to a door;

hydraulic oil enclosed within said inner tube and a portion of said annular chamber;

means for allowing said oil to flow between the interior of said inner tube and said annular chamber upon movement of said piston within said inner tube;

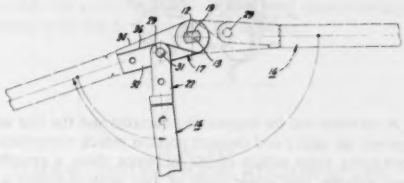
the remaining portion of said annular chamber being filled with a pressurized gas, such that movement of said piston in a first direction within said inner tube causes hydraulic oil to flow from the interior of said inner tube into said annular chamber and to compress said pressurized gas, the thus compressed pressurized gas thereby acting as means for forcing hydraulic oil from said annular chamber into the interior of said inner tube and for forcing said piston to move in a second direction within said inner tube; and

means, extending from the exterior of said cylinder through a second end thereof, for controlling the amount of hydraulic oil flow between said inner tube and said annular chamber.

4,102,005
DOOR CLOSER ARM

Raymond H. Schnarr, Princeton, Ill., and John P. Jester, Fort Washington, Pa., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Jul. 5, 1977, Ser. No. 813,091
Int. Cl.[2] E05E *3/00*
U.S. Cl. 16—49 10 Claims

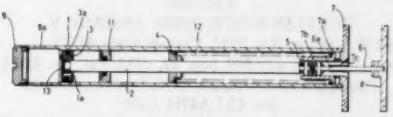


1. An arm for a door closer having a shaft adapted to rotate about a first axis comprising an arm base, means on said base engageable with said shaft for rotation therewith, an arm extension, means on said extension for engagement with a restraining device, means for connecting said arm extension and said arm base to each other for rotation relative to each other about a second axis, and means for limiting said relative rotation.

4,102,006
DOOR CLOSER

Albert Edward Jenkins, Lapworth, England, assignor to Perkins & Powell Limited, Birmingham, England

Filed Aug. 26, 1976, Ser. No. 717,878
Int. Cl.[2] E05F *3/04*
U.S. Cl. 16—51 8 Claims



1. A door closer comprising,

(a) a tubular housing, a bushing at one end, a rigid rod extending through the bushing and extending axially of the housing to be movable longitudinally of the housing,

(b) resilient means for urging said rod inwardly of the housing,

(c) fluid control means in said housing comprising a fluid filled chamber defined by the housing and a piston carried by said rod and slidable in said fluid filled chamber, the chamber being divided into two compartments and incorporating valve means between said compartments which permit relatively free movement of the fluid from one compartment to the other when the rod is moved outwardly of the housing but which when the rod is moved inwardly affords sufficient resistance to movement of the

fluid as to check the rate at which the rod is moved under the force of said resilient means,

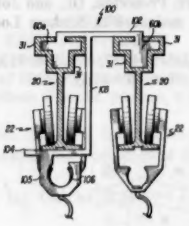
(d) a fixing plate and articulated connecting means for connecting said plate to said rod, said connecting means comprising a rigid link.

4,102,007

CURTAIN SUSPENSION ASSEMBLY

Richard W. Janson, Box 8110, Canton, Ohio 44711

Division of Ser. No. 617,508, Sep. 29, 1976, Pat. No. 4,014,071.
This application Oct. 22, 1976, Ser. No. 734,989
Int. Cl.[2] A47H *1/04*
U.S. Cl. 16—94 R **5 Claims**



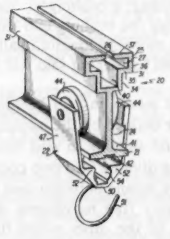
1. A traverse rod for supporting curtains and the like which comprises: an upper rod support portion which comprises two spaced-apart arms which define between them a cruciform-shaped groove, the upper ends of said arms defining a slot giving access centrally into said groove; a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said supporting portion adapted to receive curtain or the like carriers for horizontal movement thereralong; and spacer means in combination with the rod and a further like rod, said spacer means providing a predetermined lateral spacing distance between the first-mentioned rod and the additional like traverse rod, said spacer means comprising a plate member joining a pair of like cruciform-shaped members, each of said cruciform-shaped members, each of said cruciform-shaped members being received in a corresponding shaped groove of one of the rods thereby separating the rods by said distance, said spacer means comprising an obstruction means which limits movement of any said carriers received by said supporting portion of at least one of the rods, said spacer means being provided with rope support means adapted to support rope for opening and closing curtains suspended from the rods.

4,102,008

CURTAIN SUSPENSION ASSEMBLY

Richard W. Janson, Box 8110, Canton, Ohio 44711

Division of Ser. No. 617,508, Sep. 29, 1975, Pat. No. 4,014,071.
This application Oct. 22, 1976, Ser. No. 734,983
Int. Cl.[2] A47H *1/04*
U.S. Cl. 16—96 R **16 Claims**



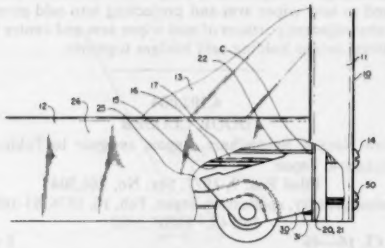
1. A traverse rod for supporting curtains and the like, the rod comprising an extruded material with a uniform cross-section throughout its length and comprising an upper rod portion which comprises two spaced apart arms which define between them a groove for slideably receiving supporting structure for the rod, the upper ends of said arms defining a slot giving said supporting structure access centrally into said groove, and a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said lower portion including flange means adapted to receive curtain or the like carriers for horizontal movement therealong, stop means for limiting movement of said rod supporting structure received in said groove, said stop means comprising a bolt received through said slot rigidly connected only to said arms, said bolt included in a portion in said groove.

4,102,009

ROLLER ASSEMBLY FOR SLIDING DOORS AND WINDOWS

Donald V. Kelly, 15903 Condor Ridge Rd., Canyon County, Calif. 91351

Filed Mar. 21, 1977, Ser. No. 779,475
Int. Cl.[2] E05D *13/02*
U.S. Cl. 16—100 **2 Claims**



1. A door or window assembly including a vertical stile and a horizontal rail at substantially a right angle corner, said rail defining an open bottom cavity;

a roller assembly including a roller journaled therein and partially extending out of said assembly to provide a rolling support surface for said assembly;

said roller assembly having a thickness generally corresponding to the transverse dimension of said cavity;

said roller assembly including an end region spaced from said roller and constituting an area for pivotal movement;

said end region defining a right angle corner whereby at one degree of adjustment said right angle corner matches the right angle corner defined by said stile and rail;

an adjusting screw extending through said assembly and engaging said roller assembly for pivoting the roller assembly generally about the corner defined by the stile and rail by contact with said stile and rail in all positions of adjustment to change the degree of extension of the roller from the cavity defined by the rail;

wherein said roller assembly is generally U shaped and includes at least a pair of integral feet adjacent to the end journaling the roller acting as stops for the full upward adjusted position of the roller and supports for the rail when in such position;

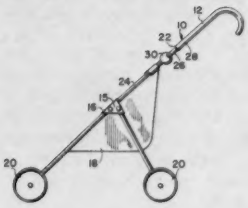
wherein said roller assembly includes a second pair of surfaces adjacent to the corner nearest the corner defined by the rail and stile whereby said latter surfaces remain in contact with said rail regardless of the degree of extension of the roller and constitutes supports therefore.

4,102,010

HANDLE ASSEMBLY FOR A BABY CARRIAGE

Esther Lazazzero, 86 Greenlawn Ave., Clifton, N.J. 07013

Filed Dec. 22, 1976, Ser. No. 753,454
Int. Cl.[2] B25G 1/04; B62B 9/20
U.S. Cl. 16—115 1 Claim



1. An improved handle assembly for a baby carriage having a frame, a seat portion, and a plurality of wheels rotatably joined to said frame, wherein the improvement comprises:

(a) a pair of handle members, each said handle member having upper and lower tubularly shaped portions, a lower end of said lower tubularly shaped portion integrally joined to said frame, said upper portion formed from upper and lower telescoping sections;

(b) a ratchet pivot means joining said lower section of said upper portion to said lower portion for allowing said upper portion to be angled with respect to said lower portion including an outer casing having a base, a top with an acruate channel therethrough, and a cylindrically shaped sidewall with an acruate shaped opening, said outer casing affixed to an upper end of said lower portion, a semi circularly shaped concave multi-toothed gear mounted in said casing, a semi circularly shaped convex multitoothed gear movably disposed in said outer casing, said convex and said concave gears meshing together, a lower end of said lower section of said upper portion extending through said acruate opening and integrally affixed to said convex gear, an externally threaded bolt affixed perpendicularly to an upper surface of said convex gear and extending upwardly through said acruate channel, a nut means threadably engaging said bolt externally to said casing and frictionally engaging said top of said casing; and

(c) means for locking said upper and said lower section of said upper portions together including an inner surface of said hollow upper section having a longitudinally aligned channel disposed therein and a plurality of spaced, transverse grooves disposed therein at right angles to said channel, a plurality of spaced bosses disposed in a longitudinal alignment on an outer surface of said lower section of said upper portion, said lower section slidably disposed in said upper section, said bosses slidably disposed in said channel, said upper section rotatable on said lower section thereby moving said bosses into said transverse grooves.

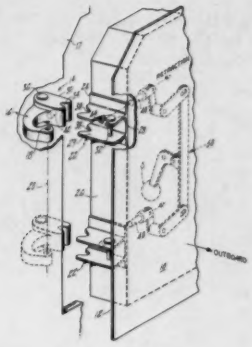
4,102,011

HINGED DOOR QUICK RELEASE

Frederick Argles Clack, Jr., Avon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 24, 1977, Ser. No. 809,837
Int. Cl.[2] E05D 7/12; B64C 1/00
U.S. Cl. 16—149 10 Claims

1. For use with a vehicle door that is pivotable about a vertical axis by one or more hinge joints each having relatively movable mating hinge members, a separate jettison joint at each hinge location comprising first and second support members releasably connected by a retractable pin, wherein said first member is fixedly attached to the door and said second member is an extension of one of the mating hinge members, means associated with said first and second members providing fixed longitudinal, vertical, and inward restraint for the door, wherein the vertical restraint means includes a laterally extending contact stop, the longitudinal and inward restraint means include one or more vertically depending contact stops, said



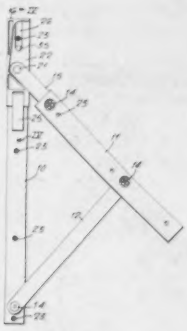
retractable pin providing outward restraint means during engagement with the first and second members.

4,102,012

SLIDING AND SWINGING WINDOW STAYS

Ronald Percival Davis, Wellington, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand

Filed Dec. 1, 1976, Ser. No. 746,616
Claims priority, application New Zealand, Dec. 3, 1975, 179432; Sep. 23, 1976, 182146
Int. Cl.[2] E05F 3/22
U.S. Cl. 16—179 19 Claims



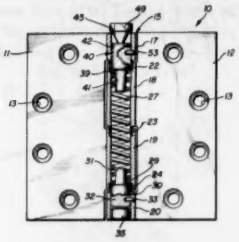
1. A window stay for adjustable mounting of a window sash on a window frame comprising a first mounting plate adapted for attachment to the frame of a window, a second mounting plate or plates adapted for attachment to a sash of a window, a carriage freely slidably mounted on the first mounting plate, first and second arms each of which is pivoted at one end to the or a second mounting plate, the first arm being pivoted at its other end to the first mounting plate, the second arm, which is of shorter length than the first arm, being pivoted at its other end to the carriage, means to lock said carriage in at least a position where the pivot mount of the second arm to the carriage is at its greatest distance away from the pivot mount of said first arm to said first mounting plate, whereby with the stay in use a sash can be moved from a closed position in a window frame to an open position and thereupon opened further by releasing the carriage from its said locked position.

4,102,013

TAMPER-PROOF SPRING HINGE

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Dec. 13, 1976, Ser. No. 749,793
Int. Cl.[2] E05F 1/12; E05D 5/12
U.S. Cl. 16—189 **10 Claims**



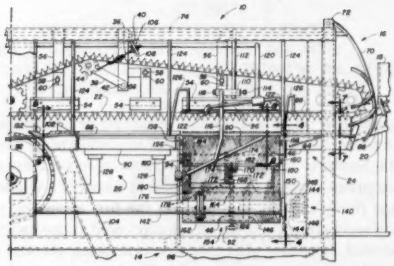
1. Tamper-proof spring biased hinge means comprising a pair of hinge leaves, each leaf defining at least one hollow hinge knuckle aligned with a hinge knuckle defined on the opposite leaf, and a bi-ended torsion spring mechanism within the aligned hinge knuckles, a first plug received within and affixed to one hinge knuckle and engaged with one end of the torsion spring mechanism, and a second plug received within and adapted to be affixed to the second hinge knuckle and engaged with the other end of said second spring mechanism, the second plug including head means having tool engaging surface thereon initially engageable by tool means for pre-torsioning said spring mechanism and means removably joining said head means to the remainder of said second plug thereby rendering said head means removable after said spring is torsioned and said second plug fixed to said second hinge knuckle, with both said first and second plugs being free from any tool engageable means upon removal of said head means.

4,102,014

MODIFICATION ASSEMBLY TO A MACHINE FOR PROCESSING THE BACKS OF POULTRY

Eugene G. Martin, and Dale M. Risser, both of Ephrata, Pa., assignors to Victor F. Weaver, Inc., New Holland, Pa.

Filed Apr. 4, 1977, Ser. No. 784,655
Int. Cl.[2] A22C 21/00
U.S. Cl. 17—11 **45 Claims**



1. A machine for processing the back carcass members of poultry comprising a frame structure to support processing stations within said machine for removing the tails and skin from the backs of a progressive series of poultry back carcass members while making a single pass therethrough having progressively assembled thereto inward from the infeed end of said machine:

(a). a poultry back carcass member infeed staging tray,

(b). a configured poultry back carcass member water slide infeed trough,

(c). an operator infeed safety guard assembly, and

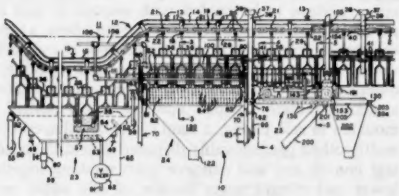
(d). an improvement modification assembly for automatically processing the interior surfaces of poultry back carcass members sequentially conveyed therethrough, said improvement modification assembly — comprises — in combination a laterally disposed poultry back carcass member flank distending means followed by a longitudinally aligned and laterally disposed rotating screen poultry back carcass member interior fatty tissue removal means in turn followed by a longitudinally aligned and laterally disposed kidney retaining membrane severing — means and a — kidney removal means, and a longitudinally continuous poultry back carcass member support and transit means.

4,102,015

METHOD AND APPARATUS FOR PROCESSING POULTRY FEET AND THE LIKE

Duane Herrick, Turlock, Calif., assignor to Foster Farms, Calif.

Filed Aug. 31, 1977, Ser. No. 829,267
Int. Cl.[2] A22C 21/00
U.S. Cl. 17—11 **11 Claims**



10. An apparatus for processing poultry feet and the like for use with a line for processing poultry wherein shackles suspended from a conveyor individually engage the legs of each bird for transport along a predetermined processing path, said apparatus comprising:

(A) an upwardly open tank having a liquid bath therein;

(B) means for maintaining said bath at a predetermined level and at a predetermined blanching temperature;

(C) means for guiding the shackles along said path so that the feet are immersed in said bath for a time sufficient to blanch the skin and loosen it from the feet without appreciably cooking the feet;

(D) a pair of substantially parallel, axially elongated, and substantially cylindrical rollers mounted for rotation about radially spaced axes extending adjacent to and laterally of the path of travel of said feet;

(E) a plurality of resiliently flexible fingers extending substantially radially from each of said rollers;

(F) means for rotating each of said rollers so that the tips of the fingers travel away from the shackles between said rollers;

(G) means for guiding the shackles along said path in following relation to the tank so that the feet extend laterally of the path of travel and pass between said rollers and are oppositely frictionally engaged therebetween by fingers of each roller, to further loosen the skin from the feet;

(H) means for guiding the shackles laterally away from the rollers as the feet pass therebetween so that the feet are withdrawn from between the rollers to strip the skin from the feet; and

(I) means mounted in following relation to said rollers for severing the feet laterally extended from said shackles adjacent to said path from their respective legs.

4,102,016

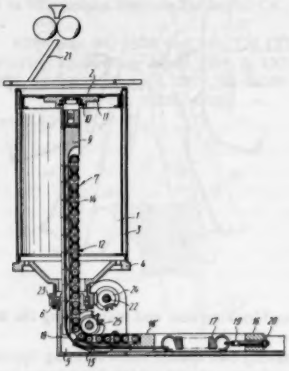
SLIVER PLACING DEVICE FOR DRAW FRAMES AND LIKE MACHINE

Ivan Dmitrievich Pak, ulitsa Juzhnaya, 29a, kv. 34; Boris Alexeevich Tjukov, ulitsa Uritskogo, 44a/10, kv. 57; Archil Levanovich Karalashvili, Ternovka, ulitsa Experimentalnaya, 4, kv. 33, and Jury Nikolaevich Denisov, proezd Kalinina, 2, kv. 9, all of Penza, U.S.S.R.

Filed Dec. 30, 1976, Ser. No. 755,547

Int. Cl.[2] B65H *54/80*

U.S. Cl. 19—159 R **6 Claims**



1. A sliver placing device for draw frames and like machines, comprising a rotatable can adapted to have a sliver placed thereinto; means for imparting rotation to said can; a bottom forming part of said can and being movable in the process of placing the sliver thereupon; a flexible rod means for lifting and lowering said bottom and being made up of several portions including an upper portion having a rotatable base for said bottom, an intermediate flexible rod portion having bearing abutments, and a lower portion having a carriage block; a tensioned, flexible but non-stretchable member connected to said upper portion of said flexible rod means and extending therefrom along said intermediate flexible rod portion, spring means operatively connected with said and tensioned member for maintaining the latter under tension and in permanent contact with the bearing abutments, thus providing for rigidity of said flexible rod portion when the latter is operated to lift and lower said movable bottom, and means operatively connected with said flexible rod means for actuating the latter to lift and lower said movable bottom while moving said flexible rod means along a path having horizontal and vertical straight portions and a curvilinear portion therebetween, with said carriage block of said lower portion of said flexible rod means being movable along said horizontal portion of said path.

4,102,017

COTTON LINT CLEANER

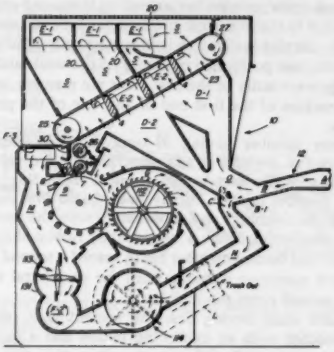
John E. Foerster, Memphis, Tenn., assignor to Foerster Process Systems, Inc., Lubbock, Tex.

Filed Mar. 8, 1976, Ser. No. 665,099

Int. Cl.[2] D01B *1/00*

U.S. Cl. 19—203 **12 Claims**

1. A cotton lint cleaner having a support frame, input air flow duct work mounted upon said support frame, a condenser means connected to said input duct work for collection of fibrous material thereon, feed rollers associated with said condenser means, a cylindrical saw associated with said feed rollers, air doffing means associated with the cylindrical saw, said air doffing means arranged for creating air flow past the cylindrical saw to doff cotton collected thereon including means for inducting air into the center of said doffing means and discharging said air at an increased pressure radially thereof, and an exhaust impeller connected by further duct work with said doffing means for expelling trash from the cleaner, said condenser means including a flexible belt having suitable apertures spaced therein and mounted for movement across the path of air flow from said input duct work for condensing fibrous material thereon as contained in the air flow, said belt being mounted upon spaced driven rollers for movement of said belt



transversely to the path of air flow, said input air flow duct work including splatter board structure for preliminary separating by gravity fibrous material from trash prior to the passage of air flow containing trash material to said condenser belt.

4,102,018

CLASPING DEVICE

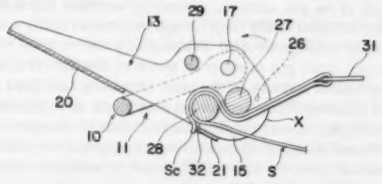
Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan

Filed Jul. 20, 1977, Ser. No. 817,537

Claims priority, application Japan, Dec. 21, 1976, 51-172024[U]; Mar. 19, 1977, 52-33682[U]; Mar. 19, 1977, 52-33683[U]

Int. Cl.[2] B25B *25/00;* **B65B** *13/24*

U.S. Cl. 24—68 CD **7 Claims**



1. A clasping device comprising:

a frame means having a pair of spaced connections, aligned with and positioned adjacent each other, and having an opening defined between said connections;

a manipulatable tongue means pivotable within the opening between the connections of the frame means and comprised of a pair of substantially elongated plate members spaced a distance slightly smaller than the distance between the connections of the frame means at the opening, each of the plate members having a first end and a second end opposite said first end, the first ends of the respective plate members being connected with each other by means of a bridge plate integral therewith and the second ends of the plate members being integrally formed with respective substantially circular walls, said tongue means being connected to the frame means with the connections respectively pivoted to the substantially circular walls to define an axis of pivot about which the manipulatable tongue means is movable between released and fastened positions relative to the frame means;

a first cross pin member extending between the substantially

circular walls with its opposed ends rigidly secured thereto and positioned inwardly of the walls with its peripheral surface spaced a first predetermined minimum distance from a peripheral edge portion of any one of the walls which is remote from the first end of the corresponding plate member;

a second cross pin member extending in spaced and parallel relation to the first cross pin member between the substantially circular walls with its opposed ends rigidly secured thereto and positioned inwardly of the walls and substantially rearwardly of the first cross pin member in terms of a direction of the first end of any one of the plate members;

a barrier member having its opposed ends connected to respective peripheral edge portions of the substantially circular walls, said barrier member extending in spaced and parallel relation to any one of said first and second cross pin members and cooperating with the second cross pin member to define a substantially ribbon-shaped clearance, said barrier member being spaced a second predetermined minimum distance from the peripheral surface of the second cross pin member;

a flexible strap having first and second ends respectively connected with an anchoring means and a slotted plate member, said flexible strap when the manipulatable tongue means is held in the released position extending from the anchoring means through the clearance between the second cross pin member and the barrier member, past around and in contact with the second cross pin member thereby forming a loop around the second cross pin member, and back past beneath and in contact with the first cross pin member, with the second end of said strap emerging outwardly of the manipulatable tongue means, so that when the strap is drawn taut as the tongue means is pivoted towards the fastened position portions of the strap one on each side of the loop are urged in overlapping relation to each other against the first cross pin member to provide substantial frictional resistance to relative movement of the strap loop after the strap is tightened by pivoting of the tongue means to the fastened position, said first predetermined distance being within the range of two times the thickness of the strap to three times the thickness of the strap; and

a third cross pin member extending between the substantially circular walls with its opposed ends rigidly secured thereto and positioned substantially rearwardly of the second cross pin member in terms of the direction of the first end of any one of the plate members, said third cross pin member being further so positioned as to provide an access clearance between the first ends of the plate members and the strap when the tongue means is pivoted to the fastened position with said first ends of said plate members spaced from said strap.

4,102,019

LOCKING ASSEMBLIES WHICH MAINTAIN BOW LOOPS IN CORDS

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001

Filed Mar. 7, 1977, Ser. No. 774,937
Int. Cl.[2] F16G *11/04*
U.S. Cl. 24—117 **11 Claims**

1. The combination comprising:

a fastener body containing a central passage having first and second ends and a restricted locking portion;

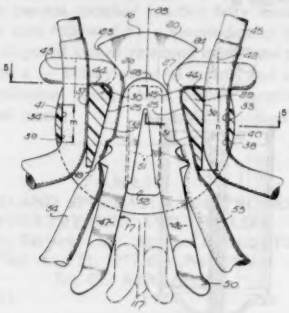
two cords extending through said passage; and

a locking unit located at least partially within said passage and movable relative to said body between a locking position in which it grips said cords tightly and locks them against longitudinal movement toward said first end of said passage and a released position permitting such movement;

said cords having portions extending out of said second end of said passage to the outside of the body and forming respectively two loops which extend first outwardly away from said body and then back to the body at opposite sides of said passage;

said cords being retained at first ends of said loops by said gripped engagement with said unit;

said body containing two side passages located at opposite sides respectively of said central passage and said unit therein, and which receive and hold portions of said cords at second ends of the loops in a relation retaining and locating said portions at said opposite sides of the central



passage and locking unit and maintaining the looped configuration of both cords;

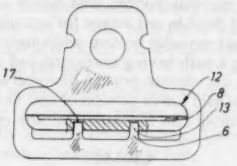
said body having two spaced walls defining opposite sides of said central passage and which have inner surfaces converging toward one another to wedge said cords together in conjunction with said locking unit, said spaced walls having outer surfaces which extend in essentially a common direction without convergence and serve as inner wall surfaces of said two side passages respectively.

4,102,020

SAFETY BELT DEVICE

Stig Martin Lindblad, Vastergatan 21, S-440 20 Vargarda, Sweden

Filed Jun. 23, 1976, Ser. No. 698,875
Claims priority, application Sweden, Nov. 28, 1975, 7513419
Int. Cl.[2] A44B *11/02;* **A47C** *31/00*
U.S. Cl. 24—164 **3 Claims**



1. A guide slit device for safety belts for vehicles comprising a holding part to be anchored in a vehicle, said holding part having an opening therein, a separate slit unit arranged within said opening and having a slit arranged to receive the band of the belt extending through the slit, said slit being defined by a lower wall having a supporting surface arranged to support and deflect the band which is pressed against the supporting surface of said slit with a force which is increased by an increased traction force acting on the band, said lower wall having penetrable portions of reduced thickness, a plurality of locking teeth fixed to the lower edge of said opening in said holding part and aligned with and directed toward said penetrable portions whereby the band may move freely in the slit when the locking teeth are retracted relative to said slit unit, said locking teeth being capable of penetrating said penetrable

portions when said slit unit moves under the action of a traction force which exceeds a predetermined value so that said locking teeth will penetrate said penetrable portions and penetrate the band so as to lock it in a fixed position relative to the guide slit device.

4,102,021

METHOD FOR MAKING CAPACITORS WITH PLATED TERMINALS

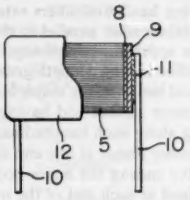
Kaname Nakao, Neyagawa; Tanejiro Ikeda, Higashi-Osaka; Koichi Kawata, Sakai, and Shoji Hara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 30, 1976, Ser. No. 728,177

Claims priority, application Japan, Oct. 6, 1975, 50-120996; Mar. 31, 1976, 51-36416; Jun. 14, 1976, 51-70049

Int. Cl.[2] H01G *4/06*

U.S. Cl. 29—25.42 **5 Claims**



1. A method for manufacture of thin film capacitors which comprises providing electrodes separated by a film dielectric to form a capacitor element with two opposed end faces, etching the opposed end faces of said capacitor element without use of liquid etchants, and depositing terminals by ion plating metal on each of the opposed end faces of the capacitor element.

4,102,022

AUTOMATICALLY LOCKING SLIDER FOR SLIDE FASTENERS

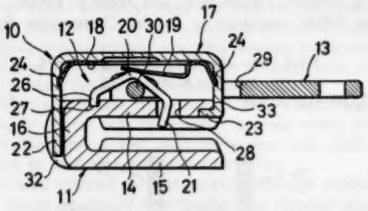
Tsunetaka Aoki, Kamiichi, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Oct. 26, 1977, Ser. No. 845,624

Claims priority, application Japan, Oct. 26, 1976, 51-143978[U]

Int. Cl.[2] A44B *19/30*

U.S. Cl. 24—205.14 R **5 Claims**



1. An automatically locking slider for slide fasteners comprising, in combination, a body defining a guide channel therein, a cover fixedly mounted on the slider body, a leaf spring supported within the cover by having its opposite ends urged against the opposed inside surfaces of the cover under its own resiliency, the leaf spring having a part thereof formed into a resilient tongue, a locking pawl normally biased by the resilient tongue of the leaf spring into the guide channel in the slider body, and a pull tab pivotally mounted on the slider body and adapted to move the locking pawl away from the guide channel in the slider body against the bias of the resilient tongue of the leaf spring upon exertion of a pull on the pull tab.

4,102,023

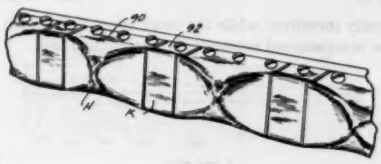
CONTOUR SHEAR DEVICE FOR PILE FABRICS

Norman Christian Abler, Menomonee Falls, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 30, 1976, Ser. No. 719,017

Int. Cl.[2] D06C *23/02*

U.S. Cl. 26—16 **11 Claims**



1. Apparatus for use in shearing pile fabrics to a particular contour comprising:

a shear rest,

a contour surface forming a part of said shear rest and providing a web path over said part of said shear rest, a portion of said contour surface forming a mirror image of a contour to be provided on finished pile fabric surfaces,

said contour surface including a plurality of distinguishable contours arranged in cooperative association with each other,

the contours being selected such that the length of the web path over the contour surface in the direction of travel of a pile fabric is the same across each distinguishable contour of the contour surface.

5. Apparatus for shearing continuously travelling lengths of pile fabrics to a desired contour, comprising:

shearing means;

a shear rest over which a pile fabric may travel,

said shear rest incorporating contour means,

said contour means including first contour elements having surfaces to bring pile fabrics into close proximity to said shearing means, and

said contour means having second contour elements having surfaces to bring pile fabrics into less close proximity to said shearing means,

the contour surfaces of said second contour elements being extended in the direction of the axis of travel of the pile fabric over the shear rest sufficiently to compensate for said less close proximity so that web paths formed thereby in the direction of the axis of travel of the pile fabric are of substantially equal length across each distinguishable contour of the contour elements to promote even contouring of a pile fabric sheared on the shear rest.

4,102,024

METHOD AND APPARATUS FOR MAKING FLATTENED EXPANDED LEAD STRIP FOR BATTERY PLATES

John P. Badger, Genoa, and Jack R. Rinker, Toledo, both of Ohio, assignors to Eltra Corporation, Toledo, Ohio

Filed Dec. 23, 1976, Ser. No. 754,131

Int. Cl.[2] B21D *31/04*

U.S. Cl. 29—6.2 **19 Claims**

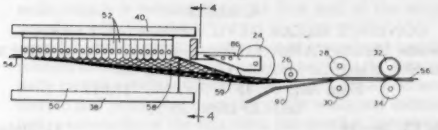
1. A method of making expanded metal strip comprising:

moving a metal strip through an expanding machine having a row of progressive dies and a cutter;

operating the machine in synchronism with movement of the strip so that the strip is expanded into a non-planar shape with a mesh portion and a longitudinally extending unexpanded portion; and

Flattening the expanded strip from its non-planar shape by moving the expanded strip past a diverter so that the

unexpanded portion is forced to a level substantially even with the outer edge of the mesh portion located transversely therefrom while the outer edge of the mesh portion is maintained substantially straight and taut.



4,102,025

CONTROLLED DEFLECTION ROLL

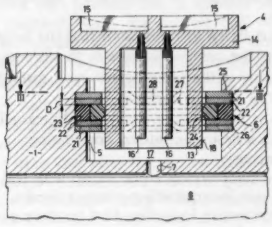
Rolf Lehmann, Mutschellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 22, 1977, Ser. No. 770,783

Claims priority, application Switzerland, Feb. 26, 1976, 2359/76

Int. Cl.[2] B21B *13/02*

U.S. Cl. 29—116 AD **6 Claims**



1. A deflection compensating roll which comprises a beam, a roll shell rotatably mounted about said beam, at least one fluid-actuated support element for exerting forces against the interior of said shell having a cylindrical portion tiltably guided within a cylindrical bore formed in said beam, and a bearing surface adjacent the interior of said shell, said cylindrical portion and the wall of said bore defining an intermediate space therebetween, means for introducing fluid under pressure into said bore, and means for sealing off said intermediate space while permitting said support element to tilt with respect to the axis of said bore upon deflection of said beam during operation, said sealing means positioned in a circumferential groove formed in the wall of said bore and including a sealing member in seal-tight engagement with said cylindrical portion of said support element, at least a pair of associated generally annular ring members disposed within said groove and extending at least partially into said intermediate space on at least one side of said sealing member, each ring member having a gap defined by a segmental cutout and at least one ring member of each pair having a diametrically opposed portion displaced out of the plane of the ring member and parallel thereto, said displaced portion extending over a circumferential distance of the ring member not greater than the circumferential distance of the gap defined by said segmental cutout of the associated ring member such that when the ring members are positioned in stacked relation, said displaced portion of said at least one ring member is positioned within the gap defined by the segmental cutout of the associated ring member for supporting at least one side of said sealing member against forces exerted by said fluid introduced into said bore.

4,102,026

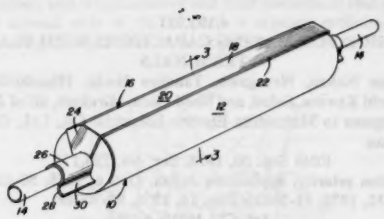
STRIPPER BAR FOR ROLLING PIN

Ralph G. DeMasi, 208 Hilldale Ave., Syracuse, N.Y. 13206

Filed Apr. 8, 1977, Ser. No. 786,482

Int. Cl.[2] B05C *1/08*

U.S. Cl. 29—110.5 **11 Claims**



1. Apparatus attachable to a rolling pin for stripping adhering material from the surface of a rotating cylinder member, the rolling pin having handle members extending from either end of the cylindrical member parallel to the longitudinal axis of said member, the apparatus comprising:

a major body portion having a length greater than the length of the cylindrical member, the major body portion having a continuous outer surface and having lateral edge portions extending along each longitudinal side thereof;

a connecting member joined at one end thereof to one each of the respective ends of the major body portion; and

end members joined at each end of the major body portion to one each of the connecting members, each end member comprising an arcuate body portion and arcuate flanges recurving from lateral edges of the arcuate body portion, the spacing between the flanges on either side of the arcuate body portion being dimensioned to allow one of the handle members of the rolling pin to snap fit within the space defined by the arcuate body portion of the end member, each end member snap fitting over each one of the handle members to bring the lateral edge portions of the major body portion into proximity to the surface of the cylindrical member of said rolling pin, the apparatus remaining essentially stationary relative to the cylindrical member on rotation of the said cylindrical member when pressure is applied to the flange, the lateral edge portions of the major body portion acting to strip adhering material from the surface of the cylindrical member on rotation of said cylindrical member during working of said material.

4,102,027

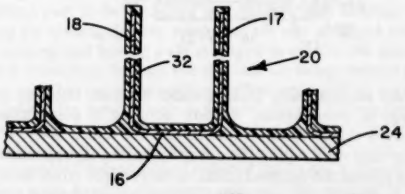
SPINE FINNED TUBE

James E. Greever, Dewitt, N.Y., and James P. Schafer, Minnetonka, Minn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 25, 1976, Ser. No. 689,774

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 AH **11 Claims**



1. A method of producing a heat exchanger tube having an aluminum component including the steps of

slitting a flat elongated sheet of thin gauge material laterally

inwardly from both edges thereof to form uniformly spaced fins along the edges of said sheet,

bending the fins to a position substantially perpendicular to the plane of the sheet so as to form a U-shaped member having two substantially parallel rows of fins extending upwardly from the base thereof,

wrapping the base of the U-shaped element about a tube to provide continuous contact between the base and the outer surface of the tube whereby the fins extend radially outwardly from the tube,

establishing a meniscus of adhesive material along both sides of the fin member at the point of contact between the fin member and the tube surface whereby the integrity of the metal-to-metal contact between the base of the fin and the tube surface is preserved, and

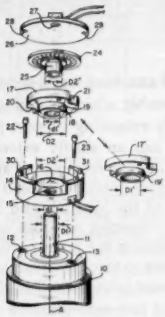
curing the adhesive to securely bond the fin member to the tube surface.

4,102,028

OPTICAL ENCODER ASSEMBLY AND CENTERING FIXTURE

Richard Kenneth Currie, Santa Barbara, Calif., assignor to Anton J. Blaser, Santa Barbara, Calif.

Filed Apr. 11, 1977, Ser. No. 786,658
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.5 **3 Claims**



1. An optical encoder assembly and centering fixture to be used on a motor shaft of given diameter, including, in combination:

(a) a mounting member carrying a light source adjacent to a peripheral point and having a central bore of greater diameter than said given diameter of the shaft of said motor and wherein said light source is positioned at a proper radial distance from the axis of said shaft for proper alignment with the remaining components of the assembly only when said mounting member is centered on the motor with said shaft extending through said central bore in exact coaxial relationship therewith;

(b) a centering fixture comprising a disc shaped element having a central hole of diameter corresponding to said given diameter of said shaft to receive said shaft in a friction fit, said element further including

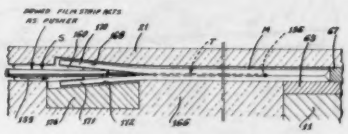
(c) a reduced external diameter portion through which said hole passes in coaxial relationship, the reduced external diameter of said portion corresponding to the internal diameter of said central bore of said mounting member so that said reduced external diameter portion is receivable in a friction fit in said central bore whereby when the hole in said element receives said shaft, and the reduced external diameter portion of said element is received in said central bore, said mounting member is precisely centered in coaxial relationship to said shaft and may be secured to said motor, said disc shaped element thereafter being removed from said shaft so that the remaining components of said optical encoder assembly can be properly assembled on said mounting member with assurance that said light source is properly positioned.

4,102,029

METHOD FOR LOADING FILM TRANSPARENCIES INTO SLIDE MOUNTS

Edwin R. Thompson, Stamford, Conn., assignor to Forox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,201
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—417 **18 Claims**



1. The method of automatically loading film transparencies into slide mounts each having at least one window therein for viewing the transparency held in the mount comprising the steps of:

providing slide mounts each having two sides defining a receiving pocket between them for receiving a film transparency into the pocket to be held in sandwich relationship between the two sides of the mount,

said two sides of each mount defining a resiliently spreadable region at one end of the mount communicating with said pocket through which a film transparency can be slid into the pocket for retaining a film transparency in said pocket when said spreadable region is in its normal position,

providing at least one fixed wedge member adjacent to a loading station,

moving the slide mounts one at a time edgewise into said loading station,

engaging the edge of each successive slide mount with said fixed wedge member as the slide mount is being moved edgewise into the loading station for spreading said spreadable region at the end of the slide mount,

sliding a film transparency into the pocket in the respective slide mount in the loading station through said spreadable region which has been spread by engagement with said fixed wedge, and

moving the respective loaded slide mounts one at a time away from the loading station and withdrawing the respective slide mount away from said fixed wedge for allowing said spreadable region to return to its normal position for retaining the respective film transparency in the pocket of the respective slide mount.

4,102,030

METHOD OF FORMING A SEALING SLEEVE JOINT CONSTRUCTION

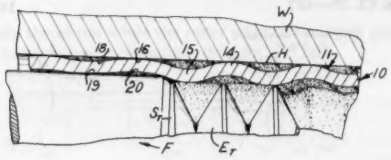
John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342

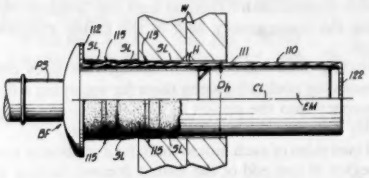
Continuation-in-part of Ser. No. 378,443, Jul. 12, 1973, Pat. No. 3,962,843, which is a continuation-in-part of Ser. No. 268,478, Jul. 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, Apr. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, Mar. 7, 1968, abandoned. This application Jun. 14, 1976, Ser. No. 695,437
Int. Cl.[2] B23P *3/00, 25/00*
U.S. Cl. 29—458 **10 Claims**

1. A method of forming a fastener joint comprising the steps of:

(a) forcing a sleeve member with a resilient tubular side wall having a predetermined wall thickness and a plurality of generally circumferentially extending resilient bends formed therein, each of the bends lying generally in a transverse plane normal to the centerline of the side wall with the bends axially spaced from each other along the

side wall centerline so that the side wall has a first effective major outside diameter and a second effective inside minor diameter where the difference between the first major diameter and the second minor diameter is greater than the wall thickness of the side wall, into holes through work pieces where the holes have a diameter a prescribed amount smaller than the first major outside diameter of the side wall so as to partly resiliently flatten the bends in the side wall of said sleeve member; and,





(b) installing the bearing area of a fastener in the sleeve member where the final installed diameter of the bearing area of the fastener is larger than the second minor inside diameter of the side wall of the sleeve member to further partly resiliently flatten the bends in the sleeve member and cause each of the bends sealingly engage the hole surface to seal the holes about the fastener.

10. The method of claim **3** further including the step of applying a sealant to the inside of the sleeve member prior to step (a).

4,102,031

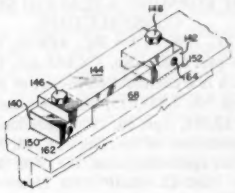
METHOD OF INSTALLING A TRANSDUCER ON A STRUCTURAL MEMBER

Keith W. Reichow, Renton; David C. English, Seattle, and Jerry L. McCauley, Renton, all of Wash., assignors to Structural Instrumentation, Inc., Tukwila, Wash.

Division of Ser. No. 615,827, Sep. 29, 1975, Pat. No. 4,042,049. This application Dec. 10, 1976, Ser. No. 749,348

Int. Cl.[2] **B23Q** *3/00*

U.S. Cl. 29—464 **4 Claims**



1. A method of installing a transducer on a structural member, the transducer having a pair of parallel fastener means spaced apart a predetermined distance, said method comprising:

providing a pair of mounting pads having a pair of fastener receiving means adapted to receive said pair of fastener means,

detachably connecting a spacer to said pads with said pair of fastener receiving means spaced apart said predetermined distance,

securing said spacer connected pads to said structural member,

detaching said spacer from said pads, and

mounting said transducer on said pads by engaging said pair of fastener means with said pair of fastener receiving means.

4,102,032

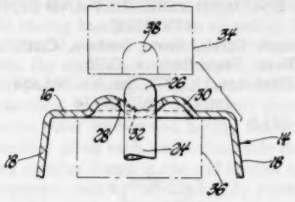
METHOD OF FABRICATING FURNITURE SPRING SUPPORT

William L Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1976, Ser. No. 746,836

Int. Cl.[2] **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—520 **6 Claims**



1. A method of attaching a coil spring to a support member of a furniture assembly when the coil spring includes a bottom coil and a radially extending support portion interconnecting the bottom coil and an axially extending tail, said method comprising the steps of forming an aperture in said support member and an upset portion disposed about at least a portion of the periphery of the aperture and out of the plane of the support member, inserting said tail of said spring into said aperture, and flattening the upset portion toward the plane of the support member to force the periphery of the aperture into gripping engagement with the tail of the coil spring.

4,102,033

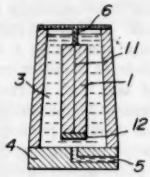
METHOD OF PRODUCING LAYER-LIKE CLAD METAL MATERIALS

Toshihiko Emi; Masashi Kawana, both of Chiba; Katsuo Kinoshita, Narashino, and Shinichiro Adachi, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 21, 1977, Ser. No. 779,464

Int. Cl.[2] **B22D** *7/02*

U.S. Cl. 29—527.3 **7 Claims**



1. A method of producing layer-like clad metal materials, comprising applying at least one organic substance selected from the group consisting of phenolic resin, amino resin, epoxy resin, polyamide resin, acrylic resin, polyester resin, and vinyl acetate resin, on a surface of a metallic core material having at its surface substantially no oxide film to form a coating film having a thickness of **50-3,000** μm, fixing said core material in a casting mold, using a fixing metal member in such a manner

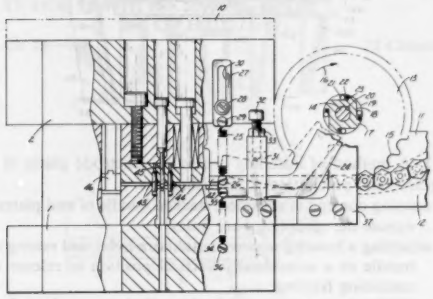
that the lower end of the core material is located at a position of 5–30 cm above the bottom surface of the mold, pouring a molten metal having the same composition around said core material up to a height of at least 5 cm above the upper end of the core material, into said mold by a bottom pouring process to form a clad metal ingot, subjecting said ingot to slab rolling or forging to form an intermediate product, and then subjecting said intermediate product to a hot working and, if necessary, a cold working.

4,102,034

PART ORIENTING AND FEEDING MECHANISM

Clyde E. Ott, c/o Pace Precision Tool & Die Co., Ohio Ave., DuBois, Pa. 15801

Filed Aug. 31, 1976, Ser. No. 719,341
Int. Cl.[2] B21D *43/04*; B26D *5/22*
U.S. Cl. 29—565 **4 Claims**



1. In part feeding and orienting mechanism of the class described, in combination, means to perform dieing operations on parts, guide means to carry such parts toward feeding mechanism connected to said dieing means, said mechanism including an index member to engage the parts and maintain them in spaced relation, means to move the member and each part engaged therewith a predetermined distance in timed relation to the dieing operation, each part so moved, engaging the part ahead thereof to move that part to position for performing said operation thereon, and orienting elements in the dieing means positioned to engage each part separately after such movement and precisely locate the same for performing said operation, the means to perform dieing operations comprise a progressive die to perform successive operations on the parts in separate steps as such parts move to successive positions, the guide means provide gravity supply of such parts toward the feeding mechanism, the feeding mechanism includes an index wheel having part engaging portions thereon, ratchet means connected to the die for movement by a movable part of said die, being provided to move said index wheel a predetermined distance and thus the parts engaged thereby likewise, and means to control the said movement.

4,102,035

MACHINING CENTER WITH AUTOMATIC TOOL CHANGER

Leonhard Voglrieder, Howell, and Raymond O. Hempel, Jr., La Salle, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 25, 1977, Ser. No. 790,224
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **45 Claims**

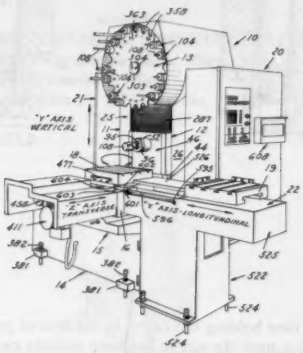
1. In a machine tool, the combination of:

(a) a tool spindle slide assembly, including a tool spindle rotatable on a first axis and being operatively mounted for transverse movement along a second axis perpendicular to said first axis of rotation of the tool spindle;

(b) a rotary tool storage and tool changer means rotatably mounted on a third axis which is parallel to said first axis and perpendicular to said second axis, and provided with a plurality of annularly disposed tool holding sockets rotatable in a plane transverse to said third axis and which are each adapted for releasably holding a tool therein;

(c) means for moving said tool spindle slide assembly along said second axis to align said tool spindle with one of said tool holding sockets, whereby said rotary tool storage and tool changer means will releasably grasp a tool supported in said tool spindle;

(d) means for providing relative axial movement between



the tool spindle and the rotary tool storage and tool changer means in one direction for removing said tool from the tool spindle;

(e) means for rotating the rotary tool storage and tool changer means to position a selected tool holding socket in axial alignment with said tool spindle; and,

(f) said means for providing relative axial movement between the tool spindle and the rotary tool storage and tool changer means, also providing relative axial movement in the other direction for inserting another tool from said selected holding socket into the tool spindle.

4,102,036

METHOD OF INSTALLING A SLEEVE BOLT IN AN OPENING

Larry Salter, Lakewood, Calif., assignor to Paul R. Briles, Inglewood, Calif.

Division of Ser. No. 724,412, Sep. 17, 1976. This application Jul. 14, 1977, Ser. No. 815,520
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—525 **3 Claims**

1. A method for installing a tapered shank and mating sleeve in a cylindrical opening located in a plurality of materials adapted to be connected together and comprising the steps of,

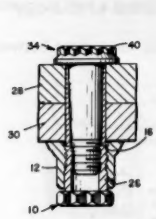
pre-assembling a two part installation nut in which the first member has external threads for mating with internal threads on the second member,

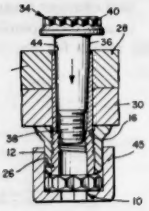
then threading internal threads on the first member onto the external threads located on the end of the tapered shank until the end surface of the first member abuts against one end of the projecting sleeve,

then while holding a bearing surface of the second member against the bottommost surface of the material being connected together, rotating the second member until the sleeve is positioned in the cylindrical opening in a desired position,

then locking the first member and second member together, and

then while holding the second member against the material, pulling the tapered shank into the opening while at the same time holding the sleeve in the desired position in the opening until the sleeve has been radially expanded.



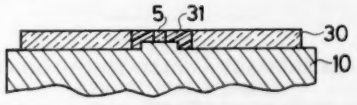


4,102,037

METHOD OF CREATING A MILLIMETER WAVE SOURCE AND OF ADAPTING SUCH A SOURCE TO WAVEGUIDE TRANSMISSION

Jacques Espaignol, and Edmond Klein, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 13, 1977, Ser. No. 787,058
Claims priority, application France, Apr. 16, 1976, 76 11442
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—583 **5 Claims**



1. A method of manufacturing a millimeter wave source, said source being formed commencing from a semiconductor diode, comprising the following steps:

(a) the welding of a semiconductor chip, able of operating as an oscillator of the desired frequency, the chip for example being an avalanche diode, to the centre of a metal mounting presenting a projecting platform, the latter extending above a flat portion of said mounting by a height *h;*

(b) etching of said chip by chemical agents, the chip having preiously been protected at its major faces respectively by said metal mounting and by a wax which is resistant to said chemical agents and is deposited upon the opposite face of said mounting;

(c) the positioning around said platform, of an impedancematching device constituted by a cylindrical frustum of a dielectric substance containing an axial hole sufficiently large to surround said projection, said hole ultimately being filled with a polymerisable resin which after polymerisation has a dielectric coefficient of the same order as said dielectric substance;

(d) the polymerisation of the resin followed by the grinding of said matching device in order to bare said semiconductor chip;

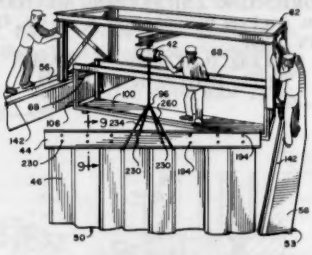
(e) the metallising of the part ground during the previous stage.

4,102,038

METHOD OF ASSEMBLING COLLECTOR ELECTRODE PANELS IN ELECTROSTATIC PRECIPITATORS

Robert L. Eagan, 9731 Mansfield St., Oak Lawn, Ill. 60453

Filed May 2, 1977, Ser. No. 792,588
Int. Cl.[2] H01S *4/00*
U.S. Cl. 29—592 R **4 Claims**



1. A method of installing collecting electrode plates in an electrostatic precipitator comprising:

opening one end of a framed, stacked bundle of said plates to expose the mounting bore holes;

attaching a hoisting means to said bore holes and raising the bundle to a substantially vertical position to release the remaining framing;

raising and supporting said feed bundle in a chamber of said precipitator;

arranging said freed plates in the required array and in a substantially coplanar relationship within said chamber to form an assembled collecting electrode assembly;

attaching the top support beams to said array of plates; and

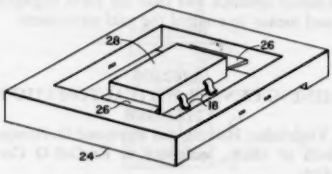
moving said collecting electrode assembly from said support to an operating position in said precipitator chamber.

4,102,039

METHOD OF PACKAGING ELECTRONIC COMPONENTS

David L. Henrickson, Phoenix; John J. Kaiser, Scottsdale, both of Ariz.; William C. Koehn, Glasgow, Scotland, and David P. Raven, North Wales, Pa., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1977, Ser. No. 768,298
Int. Cl.[2] H01L *21/66*
U.S. Cl. 29—593 **4 Claims**



1. A method of packaging an electronic component which comprises:

(a) providing a lead frame having a plurality of device sites and associated terminals at each device site,

(b) attaching at each device site a device to its associated terminals for forming an electrical connection therebetween, and

(c) forming in a single molding step,

a plastic coating over said device for producing an encapsulated device,

a plastic carrier disposed around said encapsulated device, and

frangible plastic tabs integrally connnecting said encapsulated device to said carrier for maintaining said encapsulated device in a fixed supported position within said carrier.

4,102,040

METHOD OF MANUFACTURING A CURVED COMPONENT OF A MAGNETIC CIRCUIT

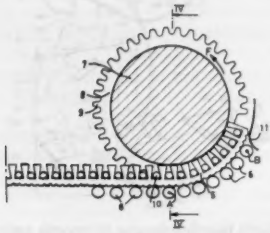
Bernard J. Rich, Issy-Les-Moulineaux, France, assignor to Societe Anonyme pour l'Equipement Electrique des Vehicules s.E.V. Marchal and S.E.V. Alternateurs, both of Issy-Les Moulineaus, France

Filed Jul. 1, 1976, Ser. No. 701,510

Claims priority, application France, Jul. 3, 1975, 7520927; Feb. 17, 1976, 7604317; Feb. 25, 1976, 7605287

Int. Cl.[2] H02K *15/02*

U.S. Cl. 29—598 **22 Claims**



1. A method of manufacturing a curved magnetic circuit assembly comprising the steps of forming a plurality of flat identical strips defined by two edges having substantially parallel median lines one of said edges of each strip having a plurality of teeth defining slots between the teeth, stacking said strips to form a stack in which the slots are aligned with each other, introducing spindles into said slots in said stack of strips, arcuately bending said stack in a circular former to form a curved magnetic circuit assembly having aligned teeth and slots; wherein said step of introducing spindles comprises introducing spindles into said slots having a length greater than the thickness of the stack of strip; and said step of bending comprises driving said spindles to bend said stack in the circular former.

4,102,041

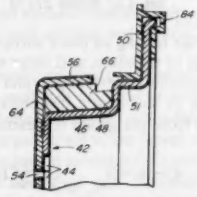
METHOD OF MAKING MICROWAVE OVEN SEAL STRUCTURE

John R. Copping, and Richard A. Foerstner, both of Iowa City, Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Mar. 28, 1977, Ser. No. 782,113

Int. Cl.[2] H01P *11/00;* **H05B** *9/06*

U.S. Cl. 29—600 **10 Claims**



1. The method comprising:

forming wall portions of a microwave energy choke by bending said portions in an annular region of a first conductive member;

forming a second conductive member with portions overhanging said wall portions by bending said wall portions of said second member;

welding said second member to said first member; and

coating said wall portions of said first member and said overhanging portions of said second member with a protective nonconductive coating after said second member is welded to said first member.

4,102,042

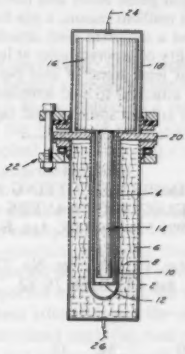
METHOD FOR PREPARING A SODIUM/SULFUR CELL

Steven A. Weiner, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1977, Ser. No. 777,284

Int. Cl.[2] H01M *6/30*

U.S. Cl. 29—623.2 **7 Claims**



1. A method for preparing a sodium/sulfur cell comprising:

A. inserting a solid sodium slug, adapted to be connected to an external circuit, into the anodic reaction zone of a cell subassembly maintained within an inert atmosphere, said cell subassembly comprising a cell container and a tubular cation-permeable barrier disposed interiorly thereof such that a first reaction zone is located within said cation-permeable barrier and a second reaction zone is located between the outer surface of said cation-permeable barrier and the inner surface of said container, one of said reaction zones being said anodic reaction zone and the other of said reaction zones being a cathodic reaction zone containing a precast composite cathodic reactant comprising a sulfur impregnated porous conductive material connected to said cation-permeable barrier and adapted to be connected to said external circuit; and

B. providing closure means for said subassembly and sealing the same to said subassembly at a temperature less than about 100° C.

4,102,043

PIN INSERTING APPARATUS

Ralph W. Andrade, and Alexander W. Duncan, both of Clayton, N.C., assignors to GTE Sylvania Incorporated, Stamford, Conn.

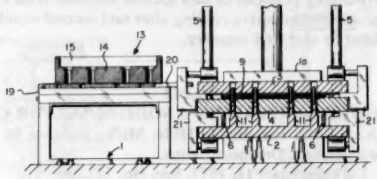
Filed Jan. 17, 1978, Ser. No. 870,188

Int. Cl.[2] H05K *3/30*

U.S. Cl. 29—739 **1 Claim**

1. Apparatus for inserting electrical connecting pins into holes in a printed circuit board, said holes having predetermined locations, said apparatus comprising a vibrating table means and a press means having a first platten and a parallel second platten with at least one of said first and second plattens movable in a direction perpendicular to said plattens and hav-

ing a parallel intermediate platten positioned between said first and second platten by resilient means, said second platten having a plurality of pin clearance holes, said intermediate platten having a plurality of pin guide holes at least some of which are aligned with said pin clearance holes, said first platten having a plurality of stand-off posts perpendicularly affixed thereto with each of said stand-off posts aligned with



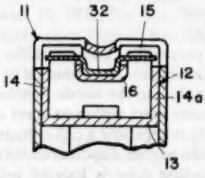
one of said pin guide holes, said stand-off posts having smaller diameter than said pin guide holes and having length as great as the length of said resilient means, a pin-loading means having a gate means and a template with attached rim, said template having a plurality of tapered holes at least some of which are alignable with at least some of said pin guide holes, said gate means slidably attached to said template and having gate holes alignable with at least some of said tapered holes.

4,102,044

DEVICE TO IMPROVE CUTTING ACTION OF ELECTRIC SHAVERS

James E. Rookus, 2902 Marshall SE. Apt. E-11, Grand Rapids, Mich. 49508

Filed Mar. 16, 1977, Ser. No. 778,232
Int. Cl.[2] B26B *19/42*
U.S. Cl. 30—34.2 **14 Claims**



11. A blade assembly having an elongated blade of the lengthwise reciprocating type for an electric shaver and an outer screen against which said blade is seated, said blade having a plurality of laterally extending, parallel bars forming its upper face, said bars being spaced apart by slots; a hair entrapment member secured to said blade, said member having a plurality of tongues, one in each slot, said tongues all being co-planar in a plane offset below the lower surface of said bars; said tongues extending substantially the full length of said slots and being narrower than said slots for forming hair receiving openings on each side thereof immediately adjacent to said bars.

4,102,045

HAND TOOL FOR CUTTING ENDS OF DECORATIVE MOLDING

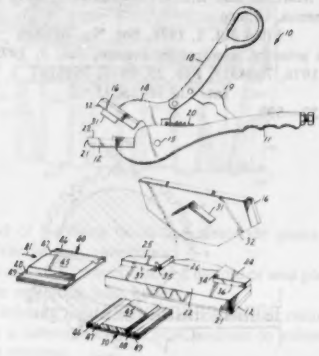
Eugene H. Bergh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 17, 1977, Ser. No. 778,382
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—287 **3 Claims**

1. A hand tool for cutting and forming terminating ends on a flexible esthetic molding product, said tool comprising

an anvil having a support surface with a front and a rear edge shaped to support a surface of said molding product and wall means adjacent said rear edge defining two pairs of angularly disposed guide surfaces for positioning an edge of said molding product in first and second fixed locations during cutting operations,

an uninterrupted cutting knife having angularly disposed cutting edges between its ends with a vertex thereof contacting said support surface adjacent said front edge and the ends thereof contacting said support surface adjacent the rear edge for cutting said molding product when disposed on said anvil and contacting a pair of said guide surfaces, said cutting knife being adapted to cut a predetermined pattern in the molding product at an end thereof when the molding product is placed against a first pair of guide surfaces and to cut an insert to mate said end when the molding product is positioned against a second pair of guide surfaces, wherein said first pair of guide surfaces



position a molding product transverse to said cutting knife and positioned between the ends of said knife to sever the molding product across its width and said second pair of guide surfaces define a path generally parallel to a line joining the ends of the cutting knife to cut an insert from an edge of the molding,

a support member for supporting said knife,

a handle,

a lever pivoted on said handle, and

a jaw member connected to each of said handle and lever for supporting said anvil and said support member for moving said knife through said molding product supported on said support surface upon relative movement between said handle and lever to bring said jaw members toward each other.

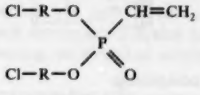
4,102,046

CUTTING EDGES COATED WITH POLYFLUOROCARBON POLYMER

Keith Stanley Downing, Tilehurst, and Richard Johnston, Woodley, both of England, assignors to The Gillette Company, Boston, Mass.

Filed May 2, 1977, Ser. No. 793,144
Claims priority, application United Kingdom, Jun. 5, 1976, 18652/76
Int. Cl.[2] B26B *21/54*
U.S. Cl. 30—346.53 **8 Claims**

1. A cutting edge having an outer surface of alumina, silica, tungsten, titanium or tantalum, said outer surface being coated with a sintered polyfluorocarbon polymer to which there had been added prior to sintering a bis-(chloroalkyl) vinyl phosphonate selected from the group represented by the formula:



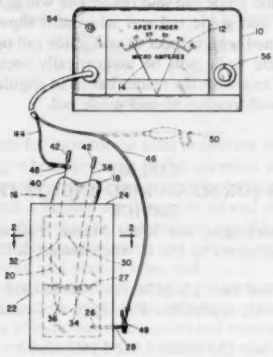
wherein each R is an alkylene group comprising 1 to 4 carbon atoms.

4,102,047

DENTAL TEACHING DEVICE

Barvo N. Walker, Mesquite, Tex., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Apr. 18, 1977, Ser. No. 788,218
Int. Cl.[2] G09B *23/28*
U.S. Cl. 32—71 3 Claims



1. A teaching device to acquaint dental students with endodontic root canal techniques performed by dentists and comprising in combination:

(a) an electronic oscillator having a scale reading in electric current measurements,

(b) a transparent model of a human tooth including root and cusp formed from electrical insulating material in a greatly enlarged size compared to a human tooth,

(c) a transparent enclosure having a hollow interior into which the root portion of said tooth model extends and the cusp of the tooth model extending above the upper end of said enclosure,

(d) said tooth model having one or more elongated root canal-simulating passages of uniform diameter therein extending from the cusp to the lower end portion of the root of said tooth model,

(e) a saline solution in the lower part of said enclosure extending around the lower end of said root at least to the lower ends of said canal-simulating passages,

(f) small diameter metal wires simulating dental reamers and files and closely complementary in diameter to said canal-simulating passages for slidable movement therein, said wires having a length greater than said passages, one end of said wires extending above the cusp at all times for manual engagement and manipulation of said wires within said passages,

(g) a metal ground element extending through a wall of said enclosure into said solution and having an exterior terminal end, and

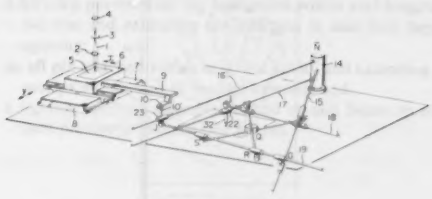
(h) electrical circuit conductors connectable respectively between said oscillator and one of said metal wires and said ground element, whereby when the lower end of one of said wires is projected to the lower end of the passage in which it is mounted to contact the solution surrounding said root, the needle of said oscillator will move to a predetermined value on said scale of said oscillator which will correspond to an electrical value indicating that the lower end of said wire is exactly at the lower end of said passage in the root of said tooth model.

4,102,048

DEVICE FOR CORRECTING POSITIONAL DEVIATION AND REDUCED SCALE OF PHOTOGRAPH

Takashi Maruyama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 578,082, May 16, 1975, abandoned. This application Feb. 27, 1976, Ser. No. 662,090
Int. Cl.[2] G06G *7/00*
U.S. Cl. 33—1 A 6 Claims



1. A device for correcting, with respect to the reference plane of an object having a group of contour lines thereon, the positional deviation and variation on a reduced scale created corresponding to the height of each contour line when the object is photographed on film through a photographic objective, the device comprising:

tracing means for tracing and generating a displacement along each of the contour lines photographed on the film;

a shaft provided on a point (N);

a correction mechanism including first guide bar means rotatably supported on the shaft, second guide bar means rotatably supported on the shaft, the first and the second guide bar means intersecting at the point N on the shaft with a predetermined angle (α), two parallel bars slidably mounted on and intersecting each of the first and the second guide bar means, means for maintaining the parallel bars parallel to each other, means for setting said parallel bars to said first guide bar means so that each distance ($\overline{NF}$) and ($\overline{NG}$) from the intersecting point (N) of the first and the second guide bar means to the intersecting points (F, G) between said first guide bar means and said two parallel bars, may satisfy the relationship

$$\frac{\overline{NF}}{\overline{NG}} = \frac{H - \Delta H}{H}$$

where H is the distance from the center of the photographic objective to the reference plane of the object, and ΔH is a distance from a contour line being traced by the tracing means to said reference plane,

said correction mechanism being connected to said tracing means at a point (J) where one of said two parallel bars which intersects said first guide bar means at the point (G) intersects said second guide bar means so that when said tracing means traces a principal point on the film the relation NF = NG may be attained; and

an indicating means for indicating a locus provided at a point (I) of intersection between the other one of said two parallel bars and said second guide bar means.

4,102,049

GRIP MEASURING DEVICE

Carl A. Harth, 1205 Wynnewood Dr., West Palm Beach, Fla. 33409

Filed Jan. 17, 1977, Ser. No. 759,664
Int. Cl.[2] G01B *3/02*
U.S. Cl. 33—1 B 1 Claim

1. A device for measuring the size of the human hand to

establish a grip size for use in determining a tennis racquet grip size or the like comprising:

a rigid, transparent planar surface;

an indicia outline of a human hand disposed on said surface and an indicia line disposed on said surface representing the longest palm crease of a human hand within said human hand outline;

a plurality of incremental measurement marks disposed on said surface displaying measurement values measured from the outline ring finger tip to the central hand outline indicia, said measurement marks being representative of the distance from the ring finger tip to a palm crease on the hand, said measurement marks being disposed in an area relative to the human hand outline to provide measurement from the ring finger tip to a particular palm crease of the human hand.

4,102,050

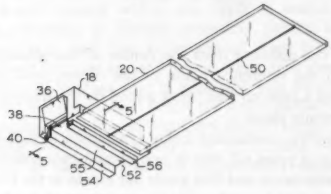
CURSOR ASSEMBLY

Ronald Arthur Roth, 274 Burton Avenue, Barrie, Ontario, Canada (L4N 2S2)

Filed Oct. 15, 1976, Ser. No. 732,732

Int. Cl.[2] B43L *13/04*

U.S. Cl. 33—76 R **4 Claims**



1. A cursor assembly for use on a viewing window of a microfiche viewer or the like comprising:

(a) a ferrous guide rail adapted to be secured to a surface of a viewing window of a reader,

(b) a slide member having a slipway recess extending longitudinally thereof, said slide member being mounted on said guide rail with said guide rail extending longitudinally through said slipway to guide said slide member along said guide rail,

(c) a permanent magnet carried by said slide member, said slipway being located within the magnetic field of said magnet whereby said slide member may be magnetically secured with respect to a guide rail extending through said slipway,

(d) a reader bar projecting outwardly from said slide member to extend across a viewing window in use,

(e) said slipway being wider than said guide rail to permit said slipway to be angularly inclined with respect to said guide rail to be angularly adjustable with respect to said guide rail to be aligned with images readable at said viewing window,

(f) said slipway recess is U-shaped and has a pair of oppositely disposed side walls formed from a ferrous material which is magnetized by said permanent magnet whereby each of said side walls of said slipway recess is magnetically attracted to said guide rail such that when one or other of the side walls of the U-shaped slipway recess engages said guide rail said reader bar will extend at right engles to said guide rail and when said slipway is angularly inclined with respect to said guide rail opposite ends of said side walls will be magnetically secured to said guide rail to secure the reader bar in an angularly inclined position with respect to said guide rail.

4,102,051

SIDE-BAR FOR MEASURING AND/OR TRACING DEVICE

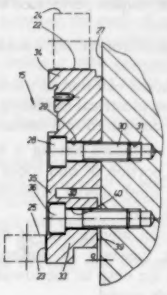
Karl Reiff, Plochingen, and Klaus Masur, Esslingen, both of Germany, assignors to Fa. C. Stiefelmauer K.G., Esslingen, Germany

Filed Dec. 27, 1976, Ser. No. 754,818

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609670

Int. Cl.[2] G01B *5/20;* **F16C** *23/00*

U.S. Cl. 33—174 P **16 Claims**



1. A guide rail, for guiding the carriage of a measuring or tracing device along one longitudinal side of a stationary levelling plate having an upper plane surface with a linear reference line thereon, and means for securing said guide rail along said one side of said levelling plate, said guide rail including:

(i) a first strip section extending along the whole of the length of the rail and having thereon a longitudinal guide surface for positioning said carriage in a plane parallel to a plane transverse to said plane surface and passing through said reference line

(ii) a second strip section having thereon:

(a) a carriage-bearing guide surface for positioning said carriage in a plane parallel to the plane defined by said plate upper surface, and

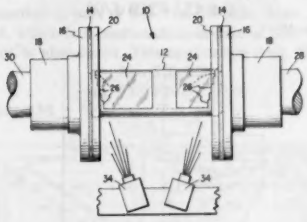
(b) a butting face for abutting against the side of the plate

(iii) flexible bi-axial joint means connecting said first strip to said second strip over at least a major part of their length, whereby, with said second strip section secured to the levelling plate with the butting face butted against the side of the plate, said first strip section may be moved, relative to said second strip section, normal to said guide surface for bringing the guide surface into parallelism with the reference line.

4,102,052
DEFLECTION INDICATOR FOR COUPLINGS

Heinz P. Bloch, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 14, 1976, Ser. No. 750,521
Int. Cl.[2] G01B 5/25, 11/27
U.S. Cl. 33—180 R 13 Claims



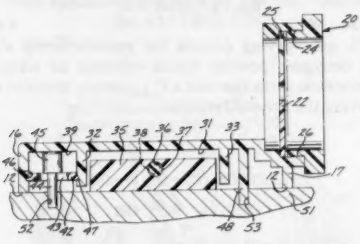
1. A system for monitoring axial deflection in turbomachinery coupling when operating in the presence of stroboscopic flashing of predetermined frequency, including a torque tube having at least a flexible diaphragm at an end thereof adapted to coupling a shaft thereto, and an inner guard having a central bore substantially parallel with and radially spaced from the outer surface of said central tube, and

deflection indicator means on said tube adjacent and partly underlying said guard, said indicator means including a plurality of indicium constructed and arranged for providing an indication of axial positioning of said shaft when coupled to said coupling with respect to said tube when viewed in the presence of said flashing, said indicium including first indicia corresponding to an axially aligned position of said coupling with said shaft and second and third indicium for indicating axially misaligned positions thereof, wherein said second indicia correspond to a misalignment in a first direction and said third indicia correspond to misalignment in a second direction opposite to said first direction.

4,102,053
REMOVABLE RIFLE SIGHT

Stephen Earl Colwell, Westminster, Calif. 92676

Filed Jul. 11, 1977, Ser. No. 814,170
Int. Cl.[2] F41G 1/08
U.S. Cl. 33—233 6 Claims



1. A sighting device adapted for convenient substitution for a rear sight assembly attached by way of a fore and aft tapped opening in the barrel structure of a fire arm, comprising:

a rectangularly shaped support fixture which includes a central cavity on the interior thereof communicating to the exterior across a first lateral surface of said fixture, and a fore and aft cavity respectively formed in said fixture in longitudinal relationship adjacent said central cavity;

a ceramic magnet conformed for sliding receipt in said central cavity, including a transverse bore formed thereacross;

a lever assembly mounted for pivotal motion across said central cavity and including an eccentrically disposed center segment conformed for receipt in said transverse bore;

a support plate including a longitudinal slot receipted in said fore cavity in substantially parallel alignment with said first lateral surface, said longitudinal slot being disposed in longitudinal alignment relative said fixture;

a forward pin received for translation within said longitudinal slot and extending for insertion in said fore tapped opening;

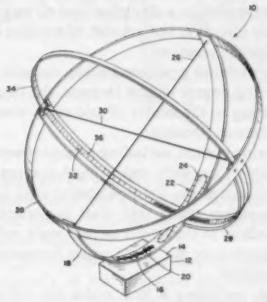
an aft pin attached within said rear cavity and extending for receipt within said aft tapped opening; and

a sighting aperture assembly formed on said fixture in adjacent proximity relative said aft pin.

4,102,054
SUNDIAL

Kemp S. Lewis, Tulsa, Okla., assignor to Danny R. Williams and Kenneth D. McPhail, both of Bartlesville, Okla.

Filed Apr. 28, 1977, Ser. No. 791,719
Int. Cl.[2] G01C 21/02, 17/34
U.S. Cl. 33—270 9 Claims



1. An adjustable sundial comprising:

(a) a first semi-circular member, a straight cord means subtended between the ends of the first semi-circular member, date calibrations inscribed on the concave surface of the first member extending approximately plus or minus 23.5° about the midpoint of the first semi-circular member, and having spacing corresponding to the sun's declination;

(b) a second semi-circular member of substantially the same size as the first member, the midpoint of the second member being secured to the midpoint of the first member and at a right angle with respect thereto, a second straight cord means subtended between the ends of the second member and crossing said first cord means at a right angle with respect thereto;

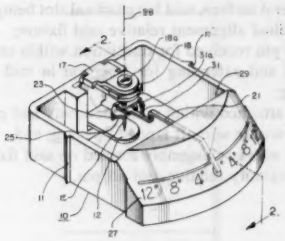
(c) a circular segment slip ring member having the same radius and curvature as the second member reciprocally disposed on the concave surface of said second member, a plurality of equally spaced time calibrations ranging from morning to evening on the concave surface of said slip ring, the 12 o'clock indicia being located near the midpoint thereof; and

(d) sun declination adjusting means carried by the sundial and cooperating with the slip ring member for correcting the time according to the sun's declination.

4,102,055
SENSITIVE INCLINOMETER

Joseph A. Volk, Jr., Florissant, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 782,130
Int. Cl.[2] G01C *9/12*
U.S. Cl. 33—345 1 Claim



1. A sensitive inclinometer for indicating angular deflection from vertical comprising:

a bracket assembly

a shaft;

means, including a bracket mounted in said bracket assembly and having bearing means, for rotatably mounting the two ends of said shaft;

a needle extending generally perpendicular to said shaft, having a free end and one end secured to said shaft and rotatable therewith in a direction and to an extent determined by the direction and amount of rotation of said shaft from a reference position;

a generally horizontal graduated scale, on said bracket assembly, having degree indicia thereon, the free end of said needle pointing to the center of said scale when said shaft is in its reference position;

a magnetic spring system, including a magnet secured to said shaft rotatable therewith and a fixed magnet secured to said bracket assembly, for positioning said needle to its reference position when said shaft is vertically aligned, while the indicia at the center of said scale indicating that a zero deflection or tilt angle exists between the shaft's axis and vertical;

a first weight, including a first metal tab offset from and extending at a right angle to said needle, secured to and offset from said shaft, the gravitational force on said first weight being in a direction parallel to the shaft's axis when said shaft is vertically aligned, thereby exerting no torque on said shaft,

said first weight producing a clockwise torque on said shaft when said shaft is titlted in one direction away from vertical and in the tilt plane defined by said shaft and the center of said scale, thereby causing pivoting of said needle to a point on one side of the center of said scale to indicate the tilt direction and also the tilt angle between the shaft's axis and vertical,

said first weight exerting a counterclockwise torque on said shaft when said shaft is tilted in the tilt plane in the other direction away from vertical, thereby effecting pivoting of said needle to a point on the other side of the center of said scale to indicate the tilt direction and angle,

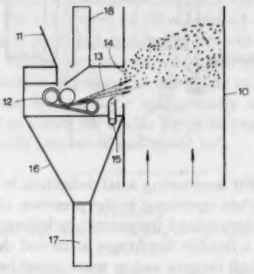
said magnetic spring system producing, when said shaft is tilted, a countertorque on said shaft equal and in opposition to the torque produced by said first weight in order to hold said needle steady on said scale;

and a second weight, including a second metal tab fixed to and offset from said shaft on the side opposite said needle and extending in alignment with said needle, for counterbalancing the weight of said needle so that said needle produces no torque on said shaft regardless of the tilt angle.

4,102,056
METHOD AND APPARATUS FOR INTRODUCING A PARTICULATE OR PULVERULENT MATERIAL INTO A FLOW OF GAS

Peter Aage Rørby Angelo, Allerød; Ole Klingest, Lyngby, and Christian Schwarzbach, Glostrup, all of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Apr. 22, 1976, Ser. No. 679,368
Claims priority, application Denmark, Apr. 22, 1975, 1726/75
Int. Cl.[2] F26B *3/08*
U.S. Cl. 34—10 6 Claims



1. A method of introducing a particulate or pulverulent material into a flow of a first gas confined within a substantially vertical tube or duct having a lateral inlet opening so as to transport said material within said duct by said gas flow, said method comprising:

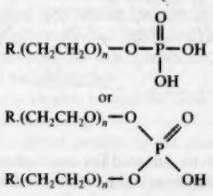
throwing a freely floating or airborne stream of said material from mechanical conveyor means into said tube or duct inlet opening from a position substantially spaced therefrom, said freely floating stream of material being exposed to at least one generally transversely directed jet of a second gas outside said duct so as to spread the particles of material in said stream and direct them into said duct through said inlet opening.

4,102,057
MANUFACTURE OF DETERGENT COMPOSITIONS

Michael David Key, Rotterdam, Netherlands, and William Gordon McNee, Chester, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,070
Claims priority, application United Kingdom, Mar. 5, 1976, 8935/76
Int. Cl.[2] F26B *3/08*
U.S. Cl. 34—10 5 Claims

1. In a spray-drying process for manufacturing a fabric washing detergent powder which contains an alkoxylated alcohol nonionic surfactant and a C_{12-20} mono- or dialkyl phosphate having the general formula



wherein R is a C_{12-20} alkyl group and n is 0 or an integer from 1–15

wherein a main crutcher slurry of fabric washing powder components is pressurised, conveyed in a high pressure line to the nozzles of a spray-drying tower and spray-dried to a powder, the improvement which comprises dis-

solving or suspending the mono- or dialkyl ester of phosphoric acid in the nonionic surfactant and introducing the resultant solution or suspension into the high pressure line.

4,102,058

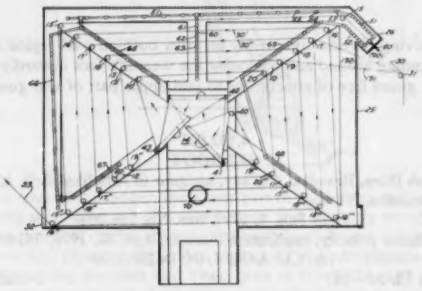
FABRIC FINISHING MACHINE

Lloyd Foster, Sr., Chopmist Hill Rd., Box 61, Chepachet, R.I. 02814

Continuation-in-part of Ser. No. 779,624, Mar. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 650,846, Jan. 21, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,928

Int. Cl.[2] F26B *13/00*

U.S. Cl. 34—155 **14 Claims**



1. In a fabric finishing machine a group of rolls over which the fabric web is lead comprising means for directing the incoming fabric web to said group of rolls, a first roll at an angle to the direction of feed of the incoming web about which the web is lead with its back to said roll, a second roll with its axis at an angle to the first roll about which the web is lead with its back to said second roll, and a third roll with its axis at an angle to the first and second rolls and not parallel to either about which the web is lead with its back to the said third roll to reverse the face and back of the fabric web as it enters and leaves the group of rolls.

4,102,059

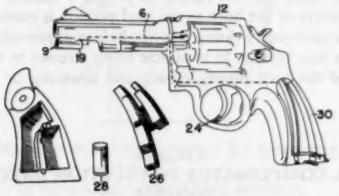
SMALL ARMS LASER TRAINING DEVICE

Joe W. Kimble, Vienna, Va.; Duane A. Burchick, Greenbelt, Md., and Edsel E. Dotson, Alexandria, Va., assignors to Cerheronics Inc., Falls Church, Va.

Division of Ser. No. 564,861, Apr. 3, 1975, Pat. No. 3,995,376. This application Aug. 2, 1976, Ser. No. 710,676

Int. Cl.[2] G09B *9/00*

U.S. Cl. 35—25 **10 Claims**



1. A weapon marksman training system comprising in combination, a barreled weapon adapted to be selectively operated from a number of modes including live fire, laser means mounted to said weapon in parallel axial alignment with the bore of the barrel, laser pulse generating means completely enclosed in said weapon and located remote from said laser means, said laser pulse generating means being electrically connected to said laser means by connecting circuitry, said laser pulse generating means comprising a power source and an electrical circuit connected to said power source, said laser pulse generating means adapted to cause said laser means to generate a burst of coherent light, a target adapted to be used with said laser weapon, said target comprising a housing, sensor means mounted to said housing, said sensor means adapted to produce an electrical pulse when struck by coherent light, circuit means connected to said sensor means adapted to transmit only electrical pulses of a predetermined width and amplitude and indicator means electrically connected to said circuit means to receive said pulses from said circuit means and produce a signal indicating a true hit on said target from said weapon.

4,102,060

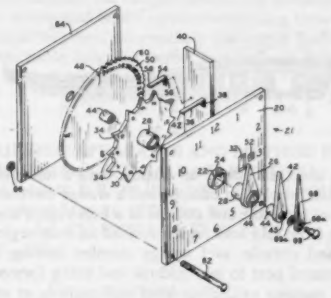
TEACHING AID FOR READING AN HOROLOGICAL CLOCK

Ronald G. Berry, R.R. #2, Columbia City, Ind. 46725

Filed Dec. 20, 1976, Ser. No. 752,434

Int. Cl.[2] G09B *19/12*

U.S. Cl. 35—39 **3 Claims**



1. A teaching aid for reading an horological clock having a rotatable minute hand and a rotatable hour hand comprising:

a clock face having horological divisions placed in sequential relation thereon;

first means for rotatably supporting an hour hand substantially centrally of said divisions and related to said divisions in sufficient proximity to visually identify the position of said hour hand relative said divisions;

second means for rotatably supporting a minute hand concentrically with and separately from said hour hand and related to said divisions in sufficient proximity to visually identify the position of said minute hand relative said divisions;

third means for digitally indicating at a predetermined display area the divisions corresponding to the respective placements of said hour and minute hands;

means for displaying said digital indications to digitally represent at said display area the division at which said hour hand is placed and the horological earlier division of the two nearest adjacent divisions between which said hour hand is placed for all horological readings and for accurate horological coordination between the hour and minute hands;

third means comprises a first disc associated and rotatable with said hour hand; said first disc carrying a first set of digital numerals corresponding to said hourly horological divisions;

said third means further comprising a second disc having a diameter an increment different than the diameter of said first disc and rotatably with said minute hand; said second disc carrying a second set of digital numerals corresponding to the horological minute divisions; said second set of numerals being registerable with said display area and being spacedly positioned on said second disc to digitally

represent at said display area that division at which said minute hand is placed for all horological readings;

said first disc having a radially extending projection corresponding to each of said digital numerals in said first set;

a first resilient arm having one end fixedly mounted relative said clock face, and the other end of said first arm being registerable with said projections to resiliently bear against said first disc projections thereby audibly indicating change in rotative position of said first disc from one digital numeral to a next adjacent numeral.

4,102,061

SHOE SOLE STRUCTURE

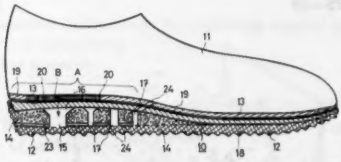
Seppo Saaristo, Vantaa, Finland, assignor to Karhu-Titan Oy, Finland

Filed Mar. 2, 1977, Ser. No. 773,655

Claims priority, application Finland, Mar. 8, 1976, 760588

Int. Cl.[2] A43B *13/18*

U.S. Cl. 36—28 **7 Claims**



1. In a shoe, an insole, an outsole, and a midsole situated between said insole and outsole, and a wedge member situated between said midsole and outsole at a heel region thereof and extending from said heel region toward an arch region of said midsole and outsole, said wedge member having an upper region situated next to said midsole and being formed with at least one opening extending from said midsole at said upper region of said wedge member downwardly toward said outsole, said opening having a maximum area directly next to said midsole at the lower surface thereof and tapering downwardly for at least part of the distance from said midsole said insole and midsole both being of sufficient flexibility to extend at least partly into said opening of said wedge member when the shoe is worn with the foot of the wearer pressing downwardly on said insole and through the latter on said midsole, whereby the shoe can adapt itself to differently shaped feet while affording a uniform support for the foot, said insole and midsole cooperating with said opening for decreasing the volume thereof when said insole and midsole are displaced downwardly when receiving the weight of a foot in said shoe with said insole and midsole having sufficient elasticity to move outwardly of said opening, increasing the volume thereof, when the weight of the foot is not transmitted to said wedge member.

4,102,062

SAFETY BOOT WITH METATARSAL PROTECTION

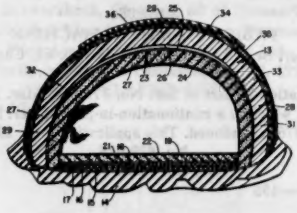
Richard R. Adams, Bettendorf, Iowa, assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Jul. 18, 1977, Ser. No. 816,805

Int. Cl.[2] A43B *13/22*

U.S. Cl. 36—72 R **9 Claims**

1. In a safety boot having an upper portion and a lower foot receiving portion extending from an ankle region to a toe enclosing region and a sole on the bottom of said foot receiving portion, means incorporated in said foot receiving portion providing wearer instep protection comprising a U-shaped guard of hard non-brittle synthetic plastics material extending arcuately at its upper part over the metatarsal portion of the wearer's foot and extending substantially straight downwardly at its sides at opposite sides of the wearer's foot to terminate in edges in substantial abutment with the sole whereby impact and crushing forces are transmitted substantially straight down said sides to be distributed and absorbed along said sole, said guard being relatively rigid but capable of temporary deformation and return to shape under excessive impact, and said foot



receiving portion comprising an inner cushion wall region for extending around and enclosing the wearer's foot inwardly of said guard free of attachment to said upper part of said guard.

4,102,063

SKI-BOOT

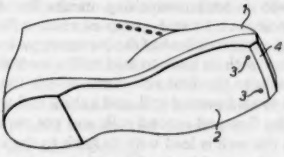
Jacob Ihlen, Brandbu, Norway, assignor to Alfa Skofabrik A/S, Brandbu, Norway

Filed Feb. 7, 1977, Ser. No. 766,008

Claims priority, application Norway, Apr. 30, 1976, 761495

Int. Cl.[2] A43B *5/04*; B62B *0/00*

U.S. Cl. 36—117 **3 Claims**



1. In a cross-country ski-boot of the type including a front portion, a heel portion, and a relatively flexible sole to be used for cross-country skiing wherein the heel is repeatedly raised and lowered relative to the ski-binding during normal cross-country skiing activity, the sole including holes in its underside for engaging studs on a plate of a toe-binding type of ski-binding which retains the front portion against the plate and leaves the heel portion unrestrained in a manner enabling the heel portion to be repeatedly freely raised and lowered relative to the front portion and to the plate; the improvement wherein the front edge of the sole located in front of the holes is inclined upwardly and forwardly to permit a limited forward rolling motion of the boot as the heel portion is raised during normal cross-country skiing activity before appreciable bending of the sole occurs, to minimize being stresses in the front portion of the boot during raising and lowering of the heel portion.

4,102,064

SWELL COMPENSATOR FOR SUCTION DREDGING SYSTEM

Hendrik Pot, Alblasserdam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Sep. 7, 1976, Ser. No. 721,048

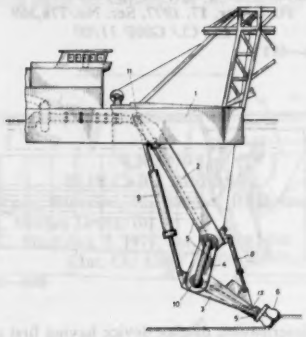
Claims priority, application Netherlands, Sep. 5, 1975, 7510520

Int. Cl.[2] E02F *3/90*

U.S. Cl. 37—67 **5 Claims**

1. In a suction dredging system comprising a vessel having

an arm or ladder pivotally secured to it about a horizontal axis, which can be placed and held in an obliquely downwardly directed position and which itself comprises an upper and a lower part which are pivotally interconnected about spaced horizontal axes by a link that makes an angle with both parts of the ladder in such a manner that motions of the upper part of the ladder in a vertical plane are hardly transmitted to the



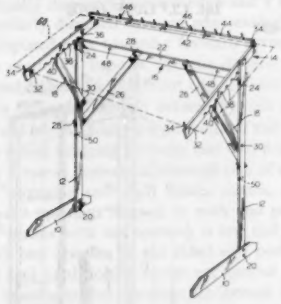
lower part of the ladder, the lower part of the ladder supporting the suction mouth of a suction pipe and a cutting member of the type that rotates around a shaft substantially extending in the vertical plane of the ladder, and a pair of hydropneumatic springs acting between said lower part of the ladder and another portion of said dredging system; the improvement in which said springs lie in different planes parallel to said horizontal axes.

4,102,065

ADJUSTABLE STAND FOR NEEDLEWORK AND THE LIKE

Boynton Selden, West Hartford, Conn., assignor to Michele R. Selden, Trustee, West Hartford, Conn.

Filed May 16, 1977, Ser. No. 796,859
Int. Cl.[2] D05C *1/02*; D06C *3/08*
U.S. Cl. 38—102.1 **10 Claims**



1. A collapsible and adjustable stand for supporting needlework and the like comprising:

A. a pair of horizontally spaced base members;

B. a pair of horizontally spaced vertical leg members;

C. disengageable fastening means securing the lower ends of said vertical leg members to said base members with said base members extending in parallel spaced relationship and adapted to support the stand upon a floor or like surface and with said leg members extending vertically upwardly therefrom in spaced parallel relationship;

D. needlework support means including:

(1) a pair of elongated horizontally spaced end elements extending parallel to said base members and adjacent the upper ends of said vertical leg members;

(2) a multiplicity of spaced upwardly projecting pins on said support means to retain the associated needlework on said support means;

E. detachable fastening means pivotally mounting said end elements of said needlework support means upon the upper end portions of said vertical leg members;

F. angular adjustment means for said support means including:

(1) strut members extending upwardly from said vertical leg members to said end elements of said support means, said strut members and end elements having cooperating means permitting engagement of the upper end portions of said strut members at each of a multiplicity of points spaced along the length of said end elements; and

(2) detachable fastening means pivotally securing the lower end portions of said strut members to said vertical leg members, whereby said support means may be adjusted into a multiplicity of angularly pivoted positions relative to said leg members; and

G. bracing means extending between said vertical leg members intermediate the length thereof and including:

(1) an enlongated brace member extending between said vertical members intermediate the length thereof; and

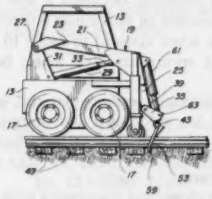
(2) detachable fastening means securing said brace member to said vertical leg members.

4,102,066

SCARIFYING APPARATUS AND METHOD FOR RAILROAD BED BALLAST REMOVAL

James W. Christoff, R.R. #1, Box 199, Crete, Ill. 60417

Filed May 11, 1977, Ser. No. 795,717
Int. Cl.[2] E02F *5/22*; E01B *29/06*
U.S. Cl. 37—104 **9 Claims**



1. Scarifying apparatus for removing ballast from a railroad bed, to permit the insertion of a cross tie under a pair of parallel rails supported by the ties, the scarifying apparatus being mounted on a vehicle movable along the rails and comprising:

a frame movably mounted on the vehicle;

a first digging plate pivotally mounted on said frame along an axis transverse to the rails, said first digging plate extending between the rails;

a second digging plate pivotally mounted on said frame along an axis transverse to the rails, said second digging plate being located outwardly of one of the rails;

a third digging plate pivotally mounted on said frame along an axis transverse to the rails, said third digging plate being located outwardly of the other rail;

each of said digging plates having an insertion portion along the outer edge thereof, each of said insertion portions being positioned at an obtuse angle with respect to the forward surface of the respective digging plate;

first driving means to move said frame;

second driving means to pivot said digging plates, said first and second driving means actuated at appropriate times in conjunction with a predetermined movement of the vehicle to form a tie receiving trench of the proper dimensions with the removed ballast being positioned for refilling of the trench;

a first retractable arm to be extended under one of the rails during the trench forming operation while being retracted during the lowering and raising of said digging plates;

a second retractable arm to be extended under the other rail during the trench forming operation while being retracted during the lowering and raising of said digging plates; and

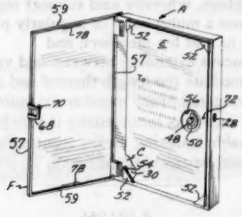
third driving means to extend and retract said retractable arms.

4,102,067

COMBINED GREETING CARD AND MUSIC BOX STRUCTURE

Fred A. Tarrant, 9661 Skylark Blvd., Garden Grove, Calif. 92641

Filed Oct. 6, 1976, Ser. No. 730,266
Int. Cl.[2] G09F *27/00*
U.S. Cl. 40—455 **2 Claims**



1. A combined greeting card and music box structure that includes:

a. a spring actuated music box mechanism that has first and second oppositely disposed side surfaces, and a spring loaded actuator pin that projects outwardly from said first surface and normally occupies a first position where it prevents operation of said music box mechanism, but said actuator pin when allowed to move to a second position causing said spring actuated music box mechanism to operate;

b. a box formed from a resilient material, which box includes a back that has a forward and rearward surface, and a continuous side wall that extends forwardly from said back;

c. a greeting card;

d. a cover that closes and cooperates with said box to define a confined space, said cover having first and second side surfaces said cover having said spring actuated music box mechanism secured to said first side surface and extending into said confined space and said actuator pin extending forwardly from said mechanism through an opening in said cover beyond said second side surface, said cover having said greeting card mounted on said second side surface thereof, with said back and cover including a plurality of reinforcing ribs that extend towards one another from said forward surface and said first side surface that are in abutting contact, and said box, cover and reinforcing ribs cooperating to provide a resonator to amplify music from said music box mechanism when said actuator pin is allowed to move to said second position;

e. an opaque panel that has first and second sides, said panel including a decorative insignia visible from said first side thereof;

f. hinge means for pivotally supporting said panel from said box, said panel when in a first position overlying said greeting card and with said second side pressure contacting said spring loaded pin to maintain the latter in said first position, and said panel when pivoted to a second position allowing said greeting card to be viewed and permitting said spring-loaded pin to move to said second position to allow said spring-actuated music box mechanism to operate; and

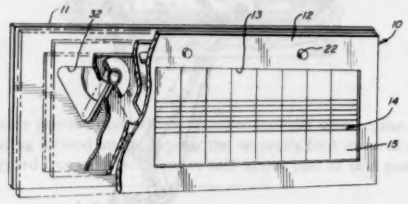
g. first means for removably locking said panel in said first position on said box to overlie said greeting card.

4,102,068

DISPLAY DEVICE

Robert K. Rutchik, Vernon Hills, Ill., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.

Filed Mar. 17, 1977, Ser. No. 778,369
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—491 **11 Claims**



1. In an interleaving display device having first and second movable display panels and a third fixed display panel capable of being positioned selectively in any one of a plurality of different configurations including a first configuration wherein said first panel overlies said second panel that in turn overlies said third panel so as to display said first panel, a second configuration wherein said second panel overlies said third panel that in turn overlies said first panel so as to display said second panel, and a third configuration wherein said third panel overlies said first panel that in turn overlies said second panel so as to display said third panel, the improvement comprising

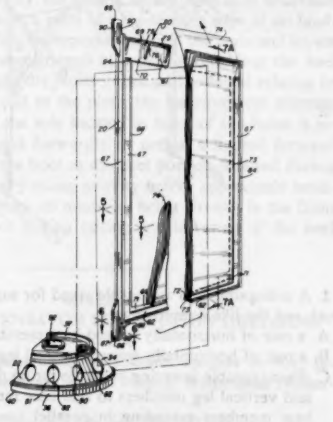
control means for effecting a direct repositioning from any one of said configurations to either of the other two configurations.

4,102,069

REVOLVING SELF-SERVICE DISPLAY STAND

Ronald P. Eckert, Northbrook, Ill., assignor to DLM, Inc., Niles, Ill.

Filed Jul. 9, 1976, Ser. No. 703,958
Int. Cl.[2] G09F *11/02*
U.S. Cl. 40—497 **18 Claims**



1. A revolving self-service poster display stand having a base, an upstanding pedestal mounted on said base for revolving about a vertical axis, a plurality of frames radially projecting from said pedestal, each frame having one side wall with

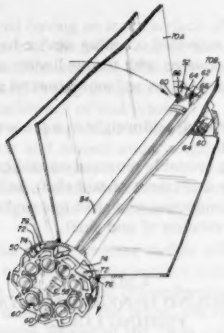
upper and lower pivot members carried thereby, said upper and lower pivot members being cruciform in cross section and extending into elliptical openings formed in spaced conically sloping surfaces of said pedestal, and means on said lower pivot member for engaging with means on the edge of one of said elliptical openings for positioning said frame in a radially oriented position under the influence of the weight of said frame.

4,102,070

FLIP CARD DISPLAY

Virgil S. Simon, Glenview, Ill., assignor to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Jun. 7, 1976, Ser. No. 693,636
Int. Cl.[2] G09F *11/06*
U.S. Cl. 40—498 **8 Claims**



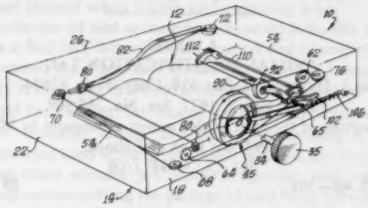
1. In a display device having a housing with a top wall, a bottom wall and a pair of side walls connected to said top wall and said bottom wall, said side walls having an upper portion with a vertically disposed forward edge and a lower portion with an angularly disposed forward edge extending from said vertically disposed edge toward a forward corner of said bottom wall, a vertically disposed opening defined by said vertically disposed edges and by a front edge of said top wall, and an angularly disposed opening defined by said angularly disposed forward edges and by a front edge of said bottom wall, card holder means bridging between said two side walls of said housing, an actuator connected through one of said walls and operatively engaging said card holder means, a plurality of equally spaced openings formed in each end portion of said card holder means with one opening in one end portion being aligned with one opening in the other end portion, said end portions of said card holder means are spaced apart discs in which said equally spaced openings are formed, a display card pivotally mounted in each pair of said aligned openings, abutment means formed on the outer edge of each end portion between each adjacent pair of openings in said end portions, said abutment means are formed on said discs between said adjacent pairs of openings with an abutment means on one disc aligned with an abutment means on the other disc, release means carried by the housing and extending into the path of movement of said display cards, indexing means on said card holder means coacting with a spring member on said housing for urging one abutment means in contact with one of said display cards for holding said card in engagement with said release means for viewing through said vertically disposed opening as a preceding card rests on one of said abutment means for viewing through said angularly disposed opening.

4,102,071

AUTOMATIC PAGE TURNING APPARATUS

James A. D'Arcy, 32325 Coast Hwy., South Laguna, Calif. 92651

Continuation of Ser. No. 669,821, Mar. 24, 1976, abandoned. This application Feb. 16, 1977, Ser. No. 768,962
Int. Cl.[2] G09F *11/06*
U.S. Cl. 40—531 **24 Claims**



1. An automatic page-turning apparatus for books and the like, wherein the apparatus comprises:

a housing having a plurality of walls defining a compartment wherein a book is removably disposed;

a page-separating means operable within said compartment for direct contact with the page to be turned in said book, said means including a pusher to engage an exposed page to be turned and to slidably push said page against another for developing a bulge therein,

a page-turning means movably mounted within said housing and arranged to sequentially operate with said page-separating means, said page-turning means located to engage and displace said bulge,

operating means interconnecting said page-separating means and said page-turning means for reciprocating back and forth movements and to different extents; and

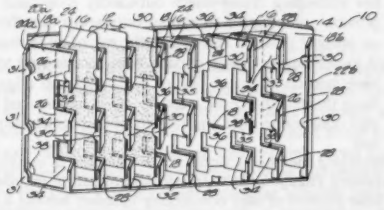
page hold-down means arranged within said compartment for direct engagement with said page, whereby said book is held in an open, readable mode.

4,102,072

DISPLAY DEVICE FOR HOLDING PAINT CHIP CARDS

Edward M. Buschman, New York, N.Y., assignor to Display Corporation International, Milwaukee, Wis.

Filed Mar. 17, 1977, Ser. No. 778,691
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—124.2 **7 Claims**



1. A display device adapted to hold elongated paint chip cards comprising, in combination,

a plurality of back walls, including a first back wall and a last back wall, said back walls being arranged in parallel staggered relation and each having first and second spaced edges,

said first edges being located in a first plane and said second edges being located in a second plane spaced from said first plane,

said first and second planes being parallel and said back walls extending at an angle thereto,

the edges of each back wall except said first edge of said first back wall and said second edge of said last back wall,

being located intermediate the first and second edges of an adjacent back wall so that adjacent back walls partially overlap,

and a step wall extending from said first edge of each of said back walls, each of said steps walls, except the back wall, extending to and engaging an adjacent one of said back walls at a line intermediate the first and second edges of said one back wall,

said display device being integrally molded from plastic.

4,102,073

ANIMAL IDENTIFICATION TAG

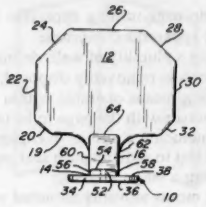
Norman J. Hayes, P.O. Box 618, Cody, Wyo. 82414

Filed Feb. 7, 1977, Ser. No. 765,909

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.[2] G09F *3/08*

U.S. Cl. 40—301 **29 Claims**



1. An animal identification tag assembly comprising:

an identification member adapted to be mounted in a generally outwardly extending upright position on the upper outer surface of an animal,

a base portion of said identification member having a first lower abutment surface adapted to be seated on the upper outer surface of the animal ear and having peripheral edge surfaces defining said first abutment surface;

a connecting hole extending through said base portion transversely to said first abutment surface, and centrally located in said base portion in inwardly spaced relationship to said peripheral edge surfaces;

a second upper abutment surface on said base portion of said identification member adjacent said connecting hole therein and spaced from said first lower abutment surface;

an identification flange portion of said identification member extending transversely outwardly from said base portion and adapted to extend outwardly therefrom in an upright position relative to the ear of an animal;

said identification flange portion being connected to said base portion adjacent one of the peripheral edge surfaces thereof and being laterally offset and spaced from said connecting hole and said second abutment surface; and

a connecting member adapted to be mounted in connecting retaining engagement with said identification member,

a base portion of said connecting member having a third abutment surface adapted to be seated on the upper inner surface of the animal ear;

a connecting shaft portion extending transversely outwardly relative to said base portion of said connecting member and adapted to extend through the animal ear and through said connecting hole in said base portion of said identification member;

a head portion on said shaft portion adapted to be located laterally outwardly beyond said base portion of said identification member and having a fourth abutment surface adapted to retainingly engage said second upper abutment surface adjacent said connecting hole in said identification member in laterally offset spaced relationship to said identification flange portion.

4,102,074

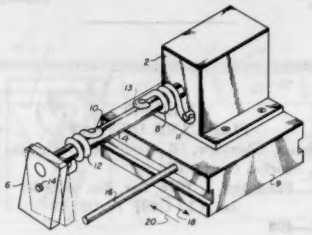
COUNTING DEVICE IMPULSE ACTIVATOR WITH TORQUE LIMITER

William L. Andre, Ben Lomond, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1977, Ser. No. 766,310

Int. Cl.[2] F41F *1/00, 27/00;* G06M *1/00*

U.S. Cl. 42—1 E **4 Claims**



1. An impulse activated counting device having a counting device impulse activator with torque limiter including:

a weight mounted for pivotal movement on a counter actuating shaft,

spring means biasing said weight to a pre-set rotary position on said shaft,

said shaft being rotatably mounted on said counter for registering rotary movement of said shaft, and

a spring interconnecting said shaft and said counter to resiliently resist rotation of said shaft.

4,102,075

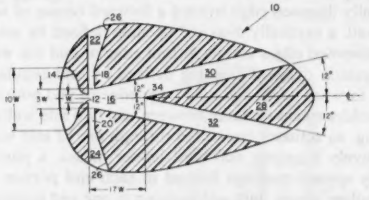
AQUATIC SOUND GENERATING SYSTEM FOR FISHING LURES

Anthony S. Wagner, 104 Red Horse G.R., and Kenneth R. Kay, 1239 North Blvd., both of, Universal City, Tex. 78148

Continuation-in-part of Ser. No. 541,699, Jan. 16, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,717

Int. Cl.[2] A01K *85/01*

U.S. Cl. 43—17.1 **9 Claims**



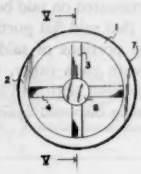
1. A fishing lure having a self-resonating variable pressure diffuser system for generating aquatic sounds to imitate the sound of live bait as the lure is drawn through the water comprising:

a lure body shaped to simulate live bait, said body having means for attaching a fishing line thereto and means for attaching a fish hook thereto; said diffuser system comprising a bistable fluidic amplifier incorporated in said lure body, said bistable fluidic amplifier having passages extending through said lure body whereupon normal retrieval of said fishing lure causes water to flow through said passages of said amplifier, said amplifier being tuned to resonate at a frequency of between 10 to 30 cycles per second to generate aquatic compression waves which imitate the sound of live bait as the lure is pulled through the water.

4,102,076
ACTION TOY

Herbert U. Martin, Chula Vista, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 25, 1977, Ser. No. 771,918
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **1 Claim**



1. An action toy, comprising

a wheel having a rim and a pair of diametrical struts intersecting each other at the center of the wheel, the rim having an outer circumference which rolls on a supporting surface;

flexible material having an inner surface affixed to the outer circumference of the wheel and an undulating outer surface, the flexible material affixed to the wheel having undulations extending at right angles to circles around the outer circumference of said wheel;

a rod having an elongated rod-like handle having spaced opposite first and second ends, adapted to be manually gripped at the first end;

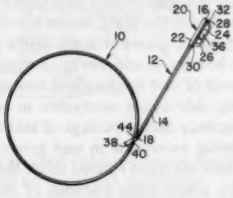
a cross-rod affixed to the handle at the second end thereof and extending at right angles therewith to form a T-shape; and

flexible material having an inner surface affixed to the cross-rod and an undulating outer surface contacting the undulating outer surface of the circumference of the wheel in part when a user rolls the wheel via the cross-rod, the flexible material affixed to the cross rod having undulations extending in the same direction as the undulations of the circumference of the wheel whereby part of the surface of the circumference of the wheel is gripped by part of the surface of the cross-rod when the user rolls the wheel via the cross-rod.

4,102,077
HOOP AND SELECTIVELY DISENGAGEABLE TRUNDLING APPARATUS

Joseph Marino, 5241 NE. 1st Ave., Ft. Lauderdale, Fla. 33334

Filed Feb. 17, 1977, Ser. No. 769,678
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **4 Claims**



1. A hoop and selectively disengagable trundling apparatus comprising:

an elongated rigid bar element, having first and second ends;

a handle element fixedly secured to said first end of said bar element;

a pair of complementary arcuate jaw elements disposed on said second end of said bar element, said jaw elements forming an openable capturing loop;

opening means for selectively opening said capturing loop disposed adjacent to said bar element;

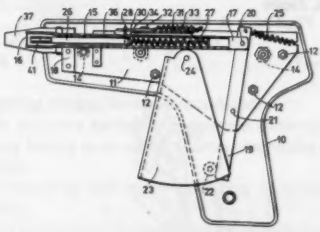
a hoop dimensioned to be selectively captured by said capturing loop when said jaw elements are in a closed position, and to be selectively disengaged from said capturing loop when said jaw elements are in an open position, said hoop being capable of free rotation about the circumference thereof when within said capturing loop;

wherein one of said arcuate jaw elements is fixedly secured on a first end thereof to said second end of said rigid bar element, the other said arcuate jaw element being pivotally affixed on a first end thereof to said second end of said rigid bar element, the second ends of each of said arcuate jaw elements falling adjacently and forming a closed capturing loop when in the closed position, the pivoting of said other arcuate jaw element opening said capturing loop and permitting the passage of said hoop between said second ends of said arcuate jaw elements.

4,102,078
BUDDING GUN

Lionel Joseph William Pettifer, c/o Industrial Development (Bangor), University College of North Wales, Dean St., Bangor, Wales

Filed Jun. 21, 1977, Ser. No. 808,471
Int. Cl.² A01G *1/00*
U.S. Cl. 47—7 **2 Claims**



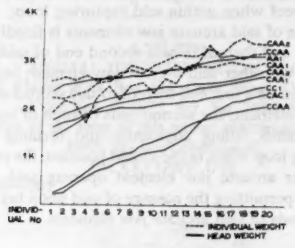
1. A budding gun comprising a frame assembly supporting an axially movable tube terminating at one end in a cutting edge and a pair of pivotable cutting blades disposed one on each side of the said end of the tube and inclined to the longitudinal axis of the tube, the cutting blades being urged together to form a single cutting edge substantially on and normal to the axis of the tube, a spring-loaded plunger slidable within the tube between a retracted position and an extended position in which the leading end of the plunger protrudes beyond said one end of the tube, and releasable securing means for retaining the plunger in the retracted position whereby in use the tube is first advanced axially relative to the cutting blades to pivotally open and project beyond the cutting blades to excise and store a bud, the tube being then withdrawn to allow the cutting blades to pivotally close and form the single cutting edge and thereafter the single cutting edge is utilised to make an incision in the bark or rind at a position to receive the stored bud, the tube is again moved axially to open the cutting blades to thereby lift the bark or rind on each side of the incision and the plunger is released to eject the stored bud into the incision.

4,102,079

METHOD OF BREEDING NEW VARIETIES OF THE FIRST FILIAL GENERATION PLANT

Setsuo Kataoka, 2-10-4 Shimizu, Suginami-Ku, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,328
Claims priority, application Japan, Jul. 5, 1976, 51/78902
Int. Cl.[2] A01H *1/02*
U.S. Cl. 47—58 4 Claims



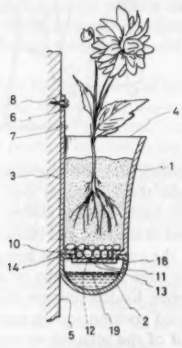
1. A method of breeding new varieties of a first filial generation plant which comprises: crossing a self-incompatible allopolyploidy plant as female with a plant of Brassica species having genomes AA, AACC or AABB as male and which is cross compatible with said female, said allopolyploidy plant being obtained by immersing the seeds of an interspecific plant formed by crossing a plant of Brassica species with a different plant of Brassica species, said species having genomes CC and AA in colchicine solution, and said Brassica species having a chromosome number which is smaller than that of said allopolyploidy plant, and collecting the seeds of said first filial generation plant.

4,102,080

FLOWERPOT

Dairoku Kojo, 3-2-6-402, Chishirodai Minami, Chiba City Chiba Prefecture, Japan

Filed Nov. 5, 1976, Ser. No. 739,376
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—67 6 Claims



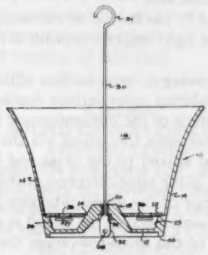
1. A flowerpot comprising a body having a top opening for receiving soil, said body having a side wall comprised of a first portion of a generally arcuate configuration and a second portion which is generally flat, said body having a bottom wall comprised of a first peripheral portion extending inwardly from said side wall of said body and a second cup-shaped portion depending downwardly from said peripheral portion, said cup-shaped portion having a flat bottom section and an upright section joined to said peripheral portion, a water-receiving bowl comprising a first portion of a generally arcuate configuration and a second portion which is generally flat, said bowl having a peripheral flange section defining a bowl opening, said bowl being detachably mounted on said body such that said cup-shaped portion of said body bottom wall is received in said bowl opening with said peripheral flange section of said bowl abutting said first peripheral portion of said body, said upright section of said cup-shaped portion having lateral projections which underlie said peripheral flange section of said bowl to thereby securely support said bowl on said body, said bowl upon being mounted on said body being rotatable to a selective position so that said flat portions of said body and bowl and said arcuate portions of said body and bowl are respectively aligned with each other, said flowerpot being mountable on a vertical wall with said aligned flat portion of said body and bowl being disposed against said vertical wall.

4,102,081

PLANT CONTAINER

Edwin M. Morrow, Rte. 1, Brevard, N.C. 28712

Filed Feb. 14, 1977, Ser. No. 768,110
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—67 1 Claim

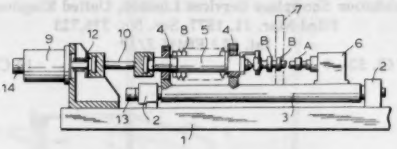


1. A plant container comprising a pot having bottom and side walls defining an open top cavity, a projection extending centrally upwardly in said cavity in the bottom portion thereof, a passageway extending along the central axis of the pot and through the bottom wall of the pot and having an opening in the upper surface of said projection, said passageway including a transverse keyway portion extending through said bottom wall, the undersurface of said pot adjacent the lower opening of said passageway having groove means arcuately displaced about the axis of said passageway from said keyway portion, a generally flat plate, means in said pot cavity for supporting said plate in spaced relation above said bottom wall to form a false bottom in said cavity, a hanging rod for said pot, the lower end of said hanging rod comprising a flattened portion having side edges receivable in said keyway portion of said passageway during passage of said hanging rod therethrough, and being receivable in said groove means on the undersurface of said pot when rotated about the axis of said passageway whereby upper edge portions of said flattened portion of said hanging rod are received in said groove means to supportably suspend the pot on said rod when the central axis of the rod is substantially vertical, and means on the lower end of said rod defining an opening for supportably receiving the upper end of another hanging rod therein whereby a plurality of said containers may be supported in vertically spaced hanging relation.

4,102,082
CAM GRINDING APPARATUS WITH MEANS TO MAINTAIN THE GRINDING SPEED CONSTANT

Yasuo Katsumi, Kameoka; Shoei Matsuda, Otsu, and Toyojiro Inano, Muko, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,758
Int. Cl.[2] B24B *17/10, 5/42*
U.S. Cl. 51—101 R 4 Claims

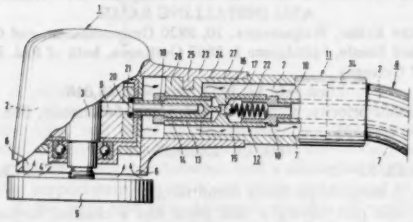


1. A cam grinding apparatus comprising a base member, a rocking bar rockably mounted on said base member, a master cam shaft rotatably mounted on said rocking bar, a drive motor connected to said master cam shaft for rotatably driving said master cam shaft, means on said apparatus to mount a cam shaft which is to be ground for being driven by said master cam shaft, a grindstone for grinding the cam shaft which is to be ground while being rocked by said rocking bar and rotated by said master cam shaft, detecting means for detecting at least one of the rotational angle of said drive motor and the rocking phase angle of said rocking bar, rotational speed command means to which said detecting means are connected and responsive to output signals from said detecting means for generating a step-like voltage waveform representing a desired rotational speed of said drive motor, and rotational speed control means connected to said rotational speed command means and to said drive motor and responsive to said step-like voltage waveform for controlling the rotational speed of said drive motor so that the circumferential speed of the cam section of the cam shaft which is to be ground at the contact point between the cam section and said grindstone is kept substantially constant.

4,102,083
PARTICLE SUCTION SYSTEMS

Leif E. Stern, Lund, Sweden, assignor to Bill Peter Philip Nederman, Helsingborg, Sweden

Filed Oct. 14, 1976, Ser. No. 732,216
Claims priority, application Sweden, Oct. 16, 1975, 7511588
Int. Cl.[2] B24B *23/02*
U.S. Cl. 51—170 R 6 Claims



1. A normally hand-held pneumatic machine tool and connecting conduit arrangement, including:

a pneumatic machine tool including a housing, said housing containing: a pneumatic motor connectable with a tool for operating the same; socket means; a dust particle suction duct arranged to suck off particles formed while said tool is engaged with a work piece, one end of said suction duct opening into said socket means; and an air supply duct connected at one end thereof with said pneumatic motor, the other end of said air supply duct opening into said socket means, said air supply duct leading directly to said pneumatic motor from said socket means and being unobstructed therebetween;

a quick coupling device arranged to be connectable with and disconnectable from said socket means;

a suction conduit connected with said quick coupling device, and arranged to be connectable thereby to said suction duct within said socket means;

an air supply conduit connected with said quick coupling device; and

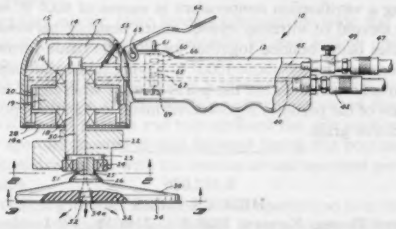
a valve device carried by said quick coupling device and connected with said air supply conduit, said valve device being operable for controlling the flow of air from said air supply conduit;

said valve device being arranged to be connectable with said other end of said air supply duct within said socket means when said quick coupling device is inserted into said socket means, and controlling the supply of air thereto from said air supply conduit.

4,102,084
WET SANDING DEVICE

Thomas N. Bloomquist, 12685 Buchanan St., Blaine, Minn. 55434

Filed Aug. 12, 1977, Ser. No. 824,063
Int. Cl.[2] B24B *23/02*
U.S. Cl. 51—170 MT 1 Claim



1. A sanding device, having in combination

a handle structure having in connection therewith a motor housing having an air motor therein comprising a plurality of vanes,

a shaft driven by said motor extending outwardly of said housing,

a sanding head carried by said shaft and driven by the same,

an air line extending from said motor outwardly of said handle to an air supply,

an axial bore through said motor shaft and an axial bore through said sanding head, said bores communicating with each other,

a water line extending through said handle to a water supply,

said water line extending to said bore of said motor shaft,

a flow control valve structure carried by said handle,

said water line and said air line having a pair of aligned vertical passages therethrough,

a valve core extending through said vertical passages and having a pair of passages therethrough to simultaneously be in phase with said water line and said air line,

means carried by said handle structure normally urging said valve core to be out of phase with said water line and said air line,

a single operating handle engaging said valve core to urge the same to be in phase with said water line and said air line, and

means controlling the flow and velocity of water through said water line.

4,102,085

ABRASIVE COATED SHARPENING TOOL AND METHOD OF MAKING IT

Peter K. Church, Cascade, and Alan G. Phillips, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Sep. 2, 1976, Ser. No. 719,729
Int. Cl.[2] B24D *3/06, 3/10*
U.S. Cl. 51—295 15 Claims

1. A method of making a sharpening tool having an abrasive surface which comprises:

providing a substrate of metal having an oxide coating formed thereon;

applying a coating on the substrate of a slurry containing a relatively hard, ductile metal powder, an amount of abrasive grain and impregnated with a binder consisting of a soluble inorganic chromium compound convertible to an insoluble chromium compound upon heating;

heat curing the slurry coated substrate to convert the chromium compound to an insoluble chromium compound at a temperature of at least 600° F. but below a temperature sufficiently high to excessively oxidize, melt and deform either the metal powder, the metal substrate and/or the abrasive grain; and,

repeating the impregnation of the slurry coating with a solution of a soluble chromium compound and heat curing cycle at least once.

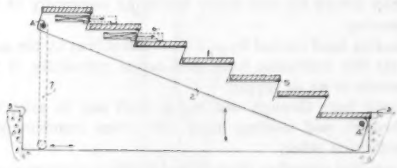
12. A sharpening tool comprising a metal substrate having adhered thereto a coating of closely packed porous mesh of finely divided discrete particles at least the surface of which consists of a refractory oxide of at least one metallic element having a vitrification temperature in excess of 600° F. essentially devoid of vitreous and/or sinter bonding between the particles being bonded together by chromic oxide formed at temperatures below about 1000° F. having substantial deposits of chromic oxide within the pores thereof wherein at least a portion of the particles is powdered metal and another portion is abrasive grain.

4,102,086

HIDDEN TIERS

Richard Thomas Korman, 2800 NE. 24th St., Ft. Lauderdale, Fla. 33305

Filed Feb. 10, 1977, Ser. No. 767,646
Int. Cl.[2] E04H *3/12*
U.S. Cl. 52—9 1 Claim



1. A convertible seating platform which forms a tiered seating array in a first up position and which is pivotal to a down position forming a floor surface comprising:

a floor having a cavity and a recessed lip around said cavity;

a pair of rigid supporting members disposed in a parallel array, said rigid supporting members having upper surfaces having a plurality of angled grooved portions, each of said grooves having an apex;

a plurality of planar seating members pivotally connected to said supporting members along the upper apex portion of the upper surface of said supporting members; and

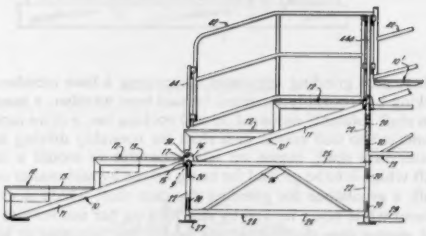
a moveable means for elevating said supporting members at one end above said floor in a first upper position where one end of each supporting member is elevated above the plane of the floor, said seating member ends engaging the angular surface grooves in the up position and said floor cavity recessed lip in the down position.

4,102,087

STAND CONSTRUCTION SYSTEM

Barry Michael Frank Jarvis, Snitterfield, England, assignor to Exhibition Showplace Services Limited, United Kingdom

Filed Mar. 11, 1977, Ser. No. 776,723
Int. Cl.[2] E04H *3/12*
U.S. Cl. 52—9 10 Claims



1. A modular stand construction system comprising a support frame, support means on said support frame to be spaced from a surface on which the system rests, a floor-carrying member, a floor means mounted on said floor-carrying member, connecting means adjacent a rear end of said floor-carrying member locatable on said support means to position said rear end substantially horizontally, said floor-carrying member having its front end arranged to be supported directly by the surface or by support means of a further support frame to be arranged at a lower level than the support means of the first said support frame, and a collapsible seat coupled to said floor means, said collapsible seat being engaged with said floor means when in an erect position and being movable from the erect position to a stowed position beneath said floor means by disengaging and pivoting said seat forward to a substantially horizontal position and then sliding it beneath said floor means.

4,102,088

MANHOLE-PIT LINING AND METHOD OF MAKING AND INSTALLING SAME

Gustav Keller, Weiperterstr. 10, 8820 Gunzenhausen, and Gerhard Enssle, Spitalgasse 1, 8867 Oettingen, both of Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,016
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605535
Int. Cl.[2] E02D *29/14*
U.S. Cl. 52—20 13 Claims

8. A manhole-pit lining comprising:

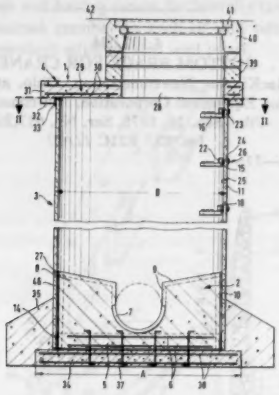
a base part having a base plate and a channel formation unitarily formed therewith;

an upwardly tubular middle part having a lower end fitted around said channel formation, an upwardly open upper end, and at least one laterally extending pipe connection between said ends and aligned with said channel formation, said middle part being formed with a plurality of horizontally throughgoing polygonal-section holes;

a step inside said middle part at each of said holes;

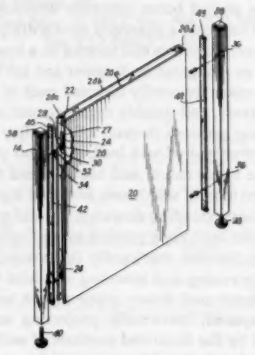
a bolt having a polygonal-section shank received snugly in each of said holes and each securing a respective step to said middle part;

a watertight joint between and rigidly fixing together said lower end of said middle part and said base part; and



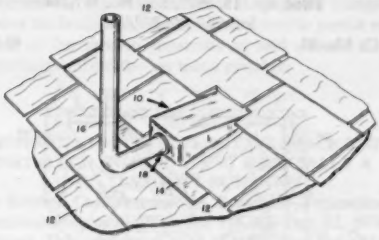
a cover part including a manhole cover secured over said upper end.

4,102,089
PARTITION STRUCTURE
John C. Paisley, Rte. 1, Box 4A, Orange, Va. 22960
Continuation-in-part of Ser. No. 723,894, Sep. 16, 1976, Pat. No. 4,038,790. This application Feb. 24, 1977, Ser. No. 771,765
Int. Cl.[2] E04B *2/82*
U.S. Cl. 52—36 **12 Claims**



1. A partition structure including a support post having a plurality of vertical sides and a partition panel secured to one of said sides, said panel having an edge portion located in parallel, closely spaced alignment with one side of the post to define a thin cavity therebetween, and a single flat elongated bracket support strip located in said cavity and secured to one side of the post, said strip having a plurality of vertically spaced embossments of predetermined configuration formed thereon and projecting from only one side of the strip, and a support bracket having an inner edge portion including a plurality of spaced mounting tabs formed thereon, said mounting tabs being spaced from each other at regular intervals selected to enter said cavity between said embossments and having an edge configuration selected to mate with at least a portion of the predetermined configuration of said embossments; said post and panel defining an open slot therebetween permitting access into said cavity and said embossments each having a first relatively flat surface portion extending perpendicularly to said slot and a second relatively flat surface portion extending generally perpendicularly to the first surface portion, said first and second flat surface portions defining a generally L-shaped bearing surface and said edge configuration of said tab having a complementary L-shaped configuration.

4,102,090
ROOF FLANGE FOR HORIZONTAL PIPES
Jerry Lee Anguish, Mineral Wells, Tex., assignor to Butler Ventamatic Corp., Mineral Wells, Tex.
Filed Sep. 28, 1977, Ser. No. 837,174
Int. Cl.[2] E04D *13/14*
U.S. Cl. 52—58 **9 Claims**



1. A roof flange assembly for providing a weather-tight seal around a pipe entering a sloped roof, said roof flange assembly comprising:

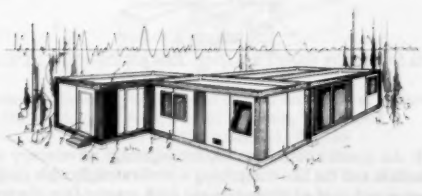
a unitary plastic plate having substantially wide flat edge portions and having a centrally located hollow upraised portion,

said upraised portion having a substantially flat top surface and defining a substantially vertically arranged forward facing flat portion and two upraised flat side portions,

an aperture located in said forward facing flat portion and communicating with the interior of said upraised portion, and

a resilient grommet arranged in said aperture so as to form a seal with said forward facing flat portion therebetween and having an inside diameter selected to fit tightly around said pipe.

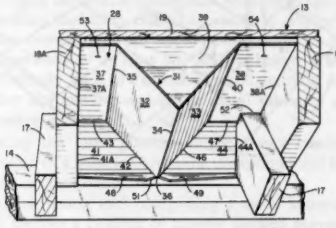
4,102,091
PREFABRICATED BUILDINGS
Hervé Farge, Maurepas, France, assignor to Societe Anonyme dite: S I C O F, France
Filed Nov. 29, 1976, Ser. No. 745,667
Claims priority, application France, Dec. 1, 1975, 75 36663
Int. Cl.[2] E04H *1/12*
U.S. Cl. 52—79.7 **7 Claims**



1. A prefabricated modular building of parallelepipedal shape, comprising a roof, a floor, vertical wall sections, and means for interconnecting same, the roof and the floor being each of unitary sandwich construction and formed from molded material, each of the roof and floor comprising; a peripheral rib providing a strengthening member and a housing

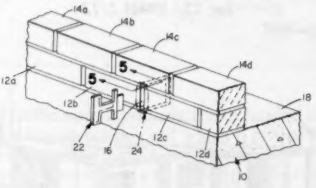
for services, and as parts of the sandwich construction, means comprising an inner layer of stratified material, a layer of plywood, a layer of insulation comprising a material selected from foam and light concrete, an outer layer of stratified material, and, on each side of the corresponding peripheral rib and for fixing the vertical wall sections, inner wooden frames and outer wooden frames for the roof, and inner wooden frames and outer wooden frames for the floor.

4,102,092
VENTING DEVICE
Bruce K. Ward, 2904 Virginia Ave., St. Louis Park, Minn. 55426
Filed Apr. 15, 1977, Ser. No. 787,744
Int. Cl.[2] E04B *7/18*
U.S. Cl. 52—92 **46 Claims**



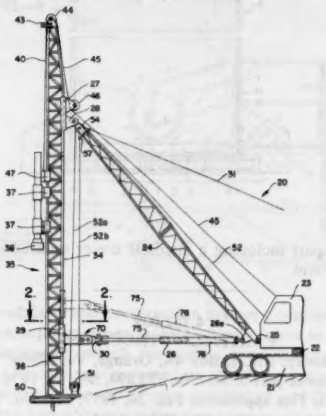
1. A vent device used to provide an air vent passage between the soffit space and attic space of a structure, said structure having a plate, laterally spaced roof rafters, and roof structure attached to the rafters, said roof structure being spaced from the plate comprising: a one-piece sheet member having at least one generally V-shaped body locatable between adjacent roof rafters forming with the inside of the roof structure an air vent passage between the soffit space and attic space, said body having a first portion engageable with the plate and second portions engageable with the roof structure, and baffle means attached to one end of the body locatable between and engageable with the roof structure and plate to close the space between the plate and roof structure without closing the air vent passage.

4,102,093
INSECT CONTROL SYSTEM
William F. Harris, 137 Catamount Rd., Tewksbury, Mass. 01876
Filed Oct. 25, 1977, Ser. No. 844,883
Int. Cl.[2] E04B *1/72*
U.S. Cl. 52—101 **7 Claims**



1. An insect control system for buildings of masonry construction and the like comprising a perforated, flexible resilient sheet member of width and height each greater than the width and height respectively of the weep hole with which it is to be used; and an inserter member that has a blade of width and height less than the width and height respectively of the weep hole with which it is to be used and a manipulating handle for securance to the blade, said sheet member being adapted to be inserted into the weep hole by said inserter blade so that its peripheral edges are deflected and in firm engagement with the margins of the weep hole, the inserted sheet member being effective to block the entry of insects into the building through the weep hole while not impairing ventilation.

4,102,094
BOTTOM BRACE FOR CRANE
Alan G. MacKinnon, Newcomerstown, Ohio, assignor to The Foundation Equipment Corporation, Newcomerstown, Ohio
Filed Sep. 26, 1975, Ser. No. 617,200
Int. Cl.[2] E21C *11/00*
U.S. Cl. 52—116 **10 Claims**



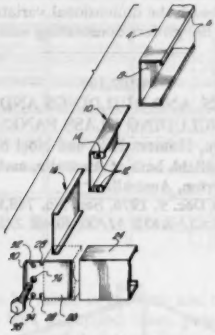
1. Crane apparatus comprising a control cab; an upwardly and forwardly angled boom pivotally attached at the lower end thereof to said cab; a generally forwardly projecting horizontal brace pivoted at one end thereof to a lower end portion of said boom; an elongated lead; upper and lower guide means carried at the outer forwardly directed ends of said boom and brace, respectively, and slidably engaging said lead adjacent to upper and lower portions thereof; a first pulley mounted adjacent to the lower end of said lead; a second pulley mounted adjacent to the upper end of said boom; a lead rope secured to an outer end portion of said boom, said lead rope comprising a first rope portion extending downwardly and around said first pulley; a second lead rope portion extending upwardly over said second pulley and rearwardly downwardly toward said control cab for raising and lowering said lead with respect to said guide means; said lower guide means having a pair of horizontally spaced, rearwardly projecting arms; connector means carried by the distal end portions of said arms connecting the forward end of said brace to said lower guide means; a power driven capstan rotatably mounted between said arms on an axis normal to said first lead rope portion, said first lead rope portion making a plurality of turns around said capstan for driving said lower guide means along said lead and independently of said lead in response to rotation of said capstan.

4,102,095
MODULAR SCREEN ASSEMBLY
Clifford W. Gartung, Newport Beach, Calif., assignor to Pleion Corporation, Santa Ana, Calif.
Filed Jan. 17, 1977, Ser. No. 760,004
Int. Cl.[2] E04B *2/56;* E04C *3/32*
U.S. Cl. 52—122 **18 Claims**

1. An improved modular sound-absorbing office screen system comprising;

a first hollow rigid frame having an upper horizontal U-shaped channel member and a pair of side U-shaped channel members, each with inwardly extending peripheral edge members, fastened together;

a wall panel mounted within the hollow rigid frame;
a second lower horizontal U-shaped channel member;
plate members extending from each end of said second channel member and having means for laterally fastening said second channel member to each of said side U-shaped channel members adjacent said wall panel;



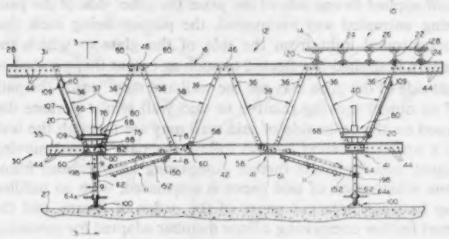
a fastener member mounted within each side channel member for fastening respectively to one plate member; and
foot support members movably mounted between said fastener members and said side channel members for vertically supporting said screen system.

4,102,096

LEG BRACE ASSEMBLY FOR ADJUSTABLE SHORING APPARATUS

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Mar. 2, 1977, Ser. No. 773,388
Int. Cl.² E04D *15/00*
U.S. Cl. 52—122 **11 Claims**



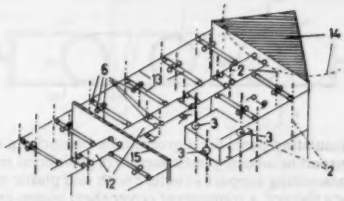
1. In combination with adjustable shoring apparatus including
a truss-like structure,
a vertically extending elongated leg associated with and extending below said structure to provide support therefor, said leg being vertically reciprocally movable relative to said structure for adjusting the combined height thereof,
said leg having a vertical series of support pin holes which extend transversely therethrough, and
means for adjustably connecting said leg to said structure at a selected vertical position relative thereto including means on the structure defining a support pin hole arranged for registering successively with said support pin holes in the leg, and a support pin removably insertable through said registering support pin holes,
a leg brace assembly which comprises:
an elongated leg brace member,
means for connecting said leg brace member to said structure for swinging movement of the leg brace member about an axis extending transversely of the structure, and
means for detachably connecting said leg brace member to said leg at a point spaced below said structure and spaced above the lower end of said leg to thereby brace the leg against the structure, said latter means including means on the leg brace member defining a connecting pin hole arranged for registering with a selected one of said support pin holes in said leg, and a connecting pin removably insertable through said connecting pin hole and said support pin hole registering therewith,
whereby said leg brace member may be disconnected from said leg and swung upwardly about said axis to a position wherein the leg brace member is disposed completely above the bottom surface of the structure to permit movement of the shoring apparatus on said surface without interference from the leg brace member.

4,102,097

CONSTRUCTION FOR SUPPORTING SPACE UNITS INSTALLED IN A BUILDING ESPECIALLY A MULTI-STOREY BUILDING

Elemer Zalotay, Cacilienstrasse 34, Bern 3007, Switzerland

Continuation-in-part of Ser. No. 526,328, Dec. 23, 1974, abandoned. This application May 19, 1976, Ser. No. 687,734
Int. Cl.² E04H *9/02*
U.S. Cl. 52—167 **4 Claims**



1. A construction for supporting space units installed in a multi-storied building, in a statically determinate manner, characterized by only three vertical columns embedded in the ground and grouped around and adjacent to each said space unit, said columns being provided with joints for supporting said space units in such a way as to allow them to move variably in a vertical direction when a portion of at least one of said columns is subjected to a vertically acting variable working load; and by horizontal beams and horizontal slabs that are embedded in vertical constructions which take up wind forces, said beams and slabs being connected to one another in such a way as to allow relative vertical movement of the columns and also the turning of the space units in all directions while preventing lateral movement due to wind forces.

4,102,098

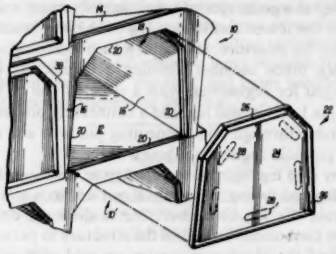
CRYPT CLOSURE PANEL AND METHOD FOR SEALING A CRYPT OPENING

Edward C. Duwe, 3840 Highland Shores, and William E. Duwe, 1203 Washington Ave., both of Oshkosh, Wis. 54901

Filed May 13, 1977, Ser. No. 796,736
Int. Cl.² E04H *13/00*; A61G *17/08*
U.S. Cl. 52—140 **9 Claims**

1. In combination with a crypt module having a polygonal opening therein for receiving a burial casket, a polygonal closure panel for fluid sealing said opening, said closure panel including relatively resilient edge means integrally formed with said closure panel and conformable substantially to the shape of the crypt module opening for sealing the opening, said edge means comprising a substantially U-shaped, inwardly

yieldable groove extending about the perimeter of said closure panel and forming an interference fit between said opening and

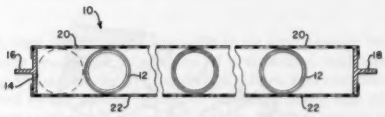


said closure panel when said closure panel is positioned in said crypt module opening.

4,102,099
INSULATING PANEL

Frank Robert Gross, and Rubie Cook Gross, both of 3926 Wood Thrush Rd., Akron, Ohio 44313

Filed May 11, 1977, Ser. No. 795,739
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—171 **2 Claims**

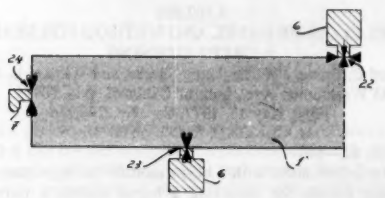


1. An insulating panel for a greenhouse comprising a plurality of transparent tubular plastic members positioned in a layer, a light transmitting support structure with said plastic members on one face thereof, a transparent cover sheet means extending over at least one surface of said plastic members and secured to said support structure to form a unitary insulating structure therefrom, and a reenforcing coil spring received in and supporting each of said tubular plastic members.

4,102,100
BUILDING WITH EXTERNAL PROVISION OF SERVICES

Roger Perreten, Veyrier, Switzerland, assignor to Etablissement d'Etudes et de Recherches Architecturales E.R.A., Geneva, Switzerland

Filed Feb. 1, 1977, Ser. No. 764,684
Claims priority, application Switzerland, Feb. 20, 1976, 2070/76
Int. Cl.[2] E04B *5/43*
U.S. Cl. 52—227 **16 Claims**

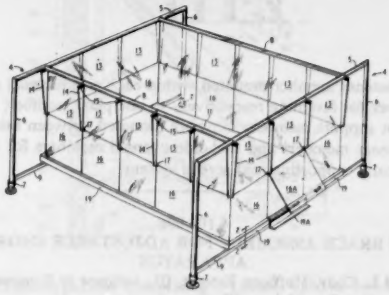


1. A building comprising at least one monobloc supporting floor unit and external vertical wind-bracing structures serving for access, service areas and technical equipment, the floor unit comprising a plurality of prefabricated shaped concrete girders which are jointed and assembled side by side, a first connection interconnecting said floor unit and one of said external structures on one side of said building for relative sliding movement only in a vertical direction, and a second connection interconnecting said floor unit with another of said external structures on a different side of said building for relative sliding movement only in a vertical direction and in one horizontal direction, thereby to absorb the dimensional variations in the floor unit transverse to the girders constituting said unit.

4,102,101
GLASS PANES, AND BUILDINGS AND THE LIKE INCLUDING GLASS PANES

Carl Philip Nielsen, Hunters Hill, and Noel Sydney Davidson Wood, East Lindfield, both of Australia, assignors to Harnee Pty. Ltd., Waverton, Australia

Filed Dec. 9, 1976, Ser. No. 748,870
Int. Cl.[2] A63B *61/00*; E04B *2/56*
U.S. Cl. 52—263 **4 Claims**



1. A squash, hand ball, racket ball or like court comprising a plurality of panes of glass each having a broken pattern of dots or lines of an opaque white material separate from the pane itself applied to one side of the pane, the other side of the pane being untreated and uncovered, the pattern being such that concentrated light from the side of the glass to which the pattern is applied is reflected to such an extent that persons on that side of the glass may see the wall and may "read" the path of an object moving relative to said wall whilst persons disposed on the other side of said wall may see through the wall to a sufficient extent to also follow the path of said moving object, and the court further comprising an overhead frame from which each of said panes is suspended, with an unfilled gap between adjacent panes of the order of 3 mm; and the court further comprising a floor member adapted for mounting approximately one meter above ground level, and wherein respective glass pane walls are suspended so that their lower edge portions are secured between a felt or like strip disposed around the floor edge and a second felt strip within a facia disposed in the plane of the floor.

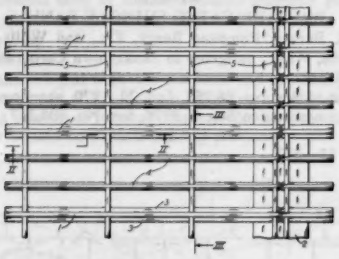
4,102,102
NONWELDED METAL GRATING

Thomas A. Greulich, 144 Spring House La., Pittsburgh, Pa. 15238

Filed Jul. 15, 1977, Ser. No. 816,027
Int. Cl.[2] E04B *5/18*
U.S. Cl. 52—338 **2 Claims**

1. A metal grating comprising a plurality of parallel horizontal beams provided with laterally projecting flanges, each beam having a plurality of longitudinally spaced vertical slots extending transversely therethrough, the lower wall of each slot being formed by the top of the free end portion of a tongue struck out of the beam, parallel cross bars of greater height than said slots extending through the slots and resting on the

tongues and having notches extending downwardly from the tops of the bars receiving the portions of said beams above said slots with said portions substantially engaging the bottoms of the notches, the height of said tongues being great enough to permit the bars during assembly to be inserted in said slots while the tongues are bent laterally out of the beams, where-



upon the bars can be raised in the slots and the tongues bent back beneath the bars to support them, pans resting on said beam flanges and spanning the spaces between the beams, and concrete resting on said pans and filling all of the space between said beams and bars to embed them in the concrete with the top of the concrete substantially flush with the tops of the beams.

4,102,103

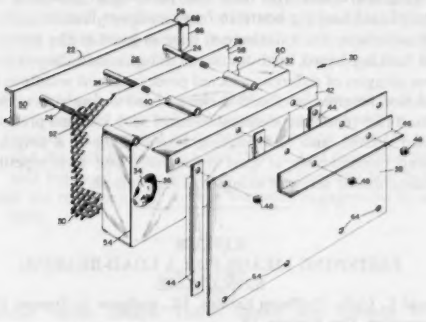
BREECHING INSULATION PANELS AND METHOD OF CONSTRUCTION

Emil Marcmann, P.O. Box 5, Medford, N.J. 08055

Filed Feb. 14, 1977, Ser. No. 768,541

Int. Cl.[2] E04B *2/00*

U.S. Cl. 52—406 **12 Claims**



1. An insulating panel comprising:

(a) a horizontally elongated supporting member having a plurality of studs for receiving screw-threaded fasteners, the studs extending orthogonally from a face of the supporting member,

(b) an inside material-retaining sheet, hung from the plurality of studs, the inside material-retaining sheet having an angled portion forming a shelf along the lower edge thereof, one end of said supporting member extending beyond a lateral edge of the inside material-retaining sheet, the opposite end of the supporting member receding a similar substantial distance from the opposite edge of the material-retaining sheet.

(c) a rectangular block of insulating material positioned against the inside material-retaining sheet between the shelf and the plurality of studs,

(d) a continuous metal facing sheet positioned on the studs to form the outside surface of the insulating panel, the facing sheet extending beyond the lateral dimensions of the rectangular block of insulating material on at least two of its four sides,

(e) tubular spacing means surrounding the studs between the inside material-retaining sheet and the facing sheet for maintaining the necessary distance between the material-retaining sheet and the facing sheet to prevent the collapse of the interstitial block of insulating material, and

(f) a plurality of screw-threaded fasteners threaded on the plurality of studs for maintaining the enumerated components of the insulating panel in a fixed relationship with respect to each other.

4,102,104

FRAME MEMBER

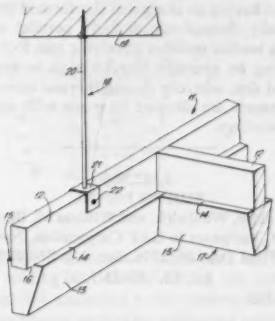
Matthew Porter Currie, "Osborne" Ivybank Crescent, Port Glasgow, Great Britain, assignor to Matthew Porter Currie, Port Glasgow and John Victor Malarkey, Newton Mearns, both of, Great Britain, part interest to each

Filed Sep. 9, 1976, Ser. No. 721,822

Claims priority, application United Kingdom, Sep. 13, 1975, 37721/75

Int. Cl.[2] E04B *5/52*

U.S. Cl. 52—494 **9 Claims**



1. An elongate frame member having a side face which has a first projecting bearing portion extending therealong a first surface extending from the first bearing portion, the first surface having at least a portion which tapers inwardly, the frame member having an end face which has a portion tapering outwardly at the same taper angle as the tapered portion of the first surface, the end face having a second bearing portion coplanar with and presented in a direction opposite to the first bearing portion so that the second bearing portion of the end face of one such frame member can rest against the first bearing of the side face of another such frame member with their respective tapered portions engaging one another.

4,102,105

INTERLOCKED CHANNEL SECTION PANELS AND CONNECTORS THEREFOR

Donald M. Taylor, Hamilton, and Donald H. Ward, Middletown, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

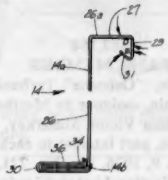
Continuation-in-part of Ser. No. 581,909, May 29, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,479

Int. Cl.[2] E04D *1/34*

U.S. Cl. 52—520 **26 Claims**

1. A clip connector for anchoring pairs of rigid interlocked metal panels of channel configuration to spaced supporting members comprising a body portion having an upstanding planar element, an upper horizontal planar portion, a deformable flange hook portion comprising a planar element depending downwardly from said upper portion and deformable towards said upstanding planar element at the line of juncture

between said deformable flange hook portion and said upper horizontal planar portion, an outermost bend retention hook extending from the free end of said deformable flange hook portion of said body portion, said retention hook terminating in a free end positioned between said upstanding planar element and said deformable hook portion, said clip connector being formed such that the included angle between said upper horizontal planar portion and said flange hook portion is within the range of 15° to 90° before deformation of said flange hook portion and such that the included angle between said deformable flange hook portion and said outermost bend retention hook thereof is within the range of 25° to 90°, a foot formed from the bottom of said planar element and extending therefrom, said foot having an elongated slot formed therein extending horizontally thereof substantially parallel to said body portion, and a washer member overlying said foot, said washer member having an aperture therethrough in alignment with said elongated slot, whereby during thermal movement of said panels, said panels are allowed to move with respect to said supporting members.



4,102,106
SIDING PANEL
Michael D. Golder, Waldwick, and William M. Bernat, Garfield, both of N.J., assignors to GAF Corporation, New York, N.Y.
Filed Dec. 28, 1976, Ser. No. 754,987
Int. Cl.[2] E04D *1/00*
U.S. Cl. 52—533 **7 Claims**

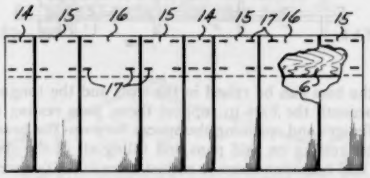
1. An elongated siding panel having first and second longitudinally extending edge portions and first and second surfaces, and further comprising:

(a) a first pair of parallel, spaced ridges on the first surface of the first edge portion of said panel, said ridges being adjacent to but spaced from the edge of said first edge portion and being parallel therewith;

(b) a second pair of spaced parallel ridges, said second pair of ridges being positioned on the second surface of the panel opposite and parallel with the first pair of ridges; and

(c) a flange extending from the first surface of the second edge portion of said panel adjacent the edge of the second edge portion, said flange terminating in a generally U shaped opening which is coplanar with the first edge portion of the panel and which opens in a direction away from said first edge portion.

4,102,107
PREFABRICATED SHINGLE PANELS
Frank S. Barker, Pompano Beach, Fla., and Willis G. Pehl, Chehalis, Wash., assignors to Shakertown Corporation, Winlock, Wash.
Division of Ser. No. 48,255, Jun. 22, 1970, abandoned. This application Sep. 9, 1974, Ser. No. 504,317
Int. Cl.[2] E04D *1/20*
U.S. Cl. 52—553 **1 Claim**



1. A prefabricated regular modular shingle panel comprising an elongated backing board of substantially rectangular cross section, and only a single course of several individual wooden shingles, each shingle having a tip portion and a butt portion and being tapered in thickness away from said butt portion toward said tip portion, and said shingles being arranged with their lengths extending transversely to the length of said backing board, with their tip portions overlying and secured to said backing board and with their butt portions overhanging one edge of said backing board in free cantilever fashion without any underlayer for a distance at least as great as the width of said backing board, said course of shingles including at least three shingles of different selected predetermined widths in the direction lengthwise of said backing board arranged in each of at least two repetitive identical series of such selected predetermined widths, and said backing board being of a length to extend continuously at least throughout said two repetitive predetermined series of shingles in said course.

4,102,108
FASTENING MEANS FOR A LOAD-BEARING STRUCTURE
David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Continuation-in-part of Ser. No. 746,314, Dec. 1, 1976. This application Mar. 14, 1977, Ser. No. 777,428
Int. Cl.[2] E04C *3/02*; F16D *1/12*
U.S. Cl. 52—693 **14 Claims**

1. In a load-bearing structure including horizontally extending chord means having a pair of spaced apart vertical webs, and a tubular member having spaced parallel opposite walls and extending outwardly from said chord means, said member having an end disposed between said webs with said walls each adjacent to one of the webs, said end having a pair of registering circular bolt holes in respective walls and adjacent to said webs, said webs each having a circular bolt hole registering with each adjacent wall bolt hole, said pair of wall bolt holes and said web bolt holes registering therewith being adapted for receiving therein threaded bolt and nut-type fastening means serving to connect said chord means and said member together in a structure adapted for supporting a load on said chord means, and also serving to transfer load forces between said webs and said walls on both sides of said member, fastening

means inserted in said pair of wall bolt holes and said web bolt holes registering therewith, and comprising:

a bolt having

a head,

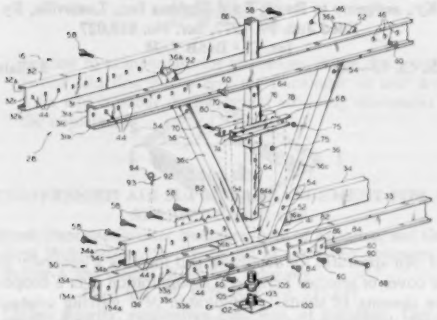
a shank integral with said head and projecting axially therefrom, said shank including a cylindrical bearing portion of reduced diameter, and

a threaded stem of further reduced diameter projecting axially from said shank, and

a nut having

a head, and

a shank integral with said nut head and projecting axially therefrom, said nut shank including a cylindrical bearing portion of reduced diameter the same as the diameter of said bolt shank bearing portion,



said nut head and shank having a threaded bore extending axially therethrough and adapted for receiving said stem in threaded engagement with the nut;

said bolt shank being inserted through one of said wall bolt holes and said web bolt hole registering therewith in load-bearing engagement of its bearing portion with the wall and the web having the holes therein, and extending from said bolt head in the direction of the paired wall bolt hole,

said nut shank being inserted through said paired wall bolt hole and said web bolt hole registering therewith in load-bearing engagement of its bearing portion with the wall and the web having the holes therein, and extending from said nut head in the direction of said one wall bolt hole,

said nut receiving said stem in threaded engagement in said bore.

4,102,109

PRESS

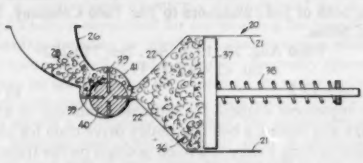
Theodor Victor Modrá, Thistle Island, and Norman Wills Growden, Wedge Island, both of Port Lincoln, Australia

Filed Apr. 13, 1977, Ser. No. 786,966

Claims priority, application Australia, Apr. 13, 1976, 5575/76

Int. Cl.[2] B65B *1/24, 63/02*

U.S. Cl. 53—24 **7 Claims**



4. A method of pressing wool into a bale in a wool press having walls which surround a bale-forming space, and spaced apart surfaces which define between them a mouth to said space, the maximum mouth width in a direction perpendicular to a said surface being less than the maximum bale space width between said walls in the same direction, the maximum mouth width being sufficiently small that wool when in said space at superatmospheric pressure does not disgorge from the mouth, the method comprising injecting wool through said mouth under high pressure into said space, discontinuing said wool injection when a bale has been formed therein, surrounding the bale with bale retaining means, and removing the bale from said space.

4,102,110

COIN PACKAGING SYSTEM

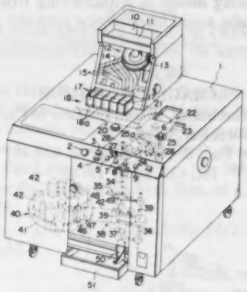
Nobuhiro Iizuka, and Yoshihiro Hatanaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Aug. 30, 1977, Ser. No. 829,092

Claims priority, application Japan, Sep. 6, 1976, 51-106406; Sep. 18, 1976, 51-112203

Int. Cl.[2] B65B *57/10, 57/20, 11/04*

U.S. Cl. 53—59 R **3 Claims**



1. A coin packaging system comprising:

(a) a coin sorting section for sorting out coins of plural denominations according to the denominations;

(b) a coin packaging section for packaging coins of a denomination selected out of the coins thus sorted out, for every predetermined number of pieces thereof; and

(c) a coin selecting means for selecting a denomination of coins to be packaged out of the coins sorted out by said coin sorting section, so that said coin packaging section operates to package the coins sorted out according to the denominations, on the basis of a denomination selected.

4,102,111

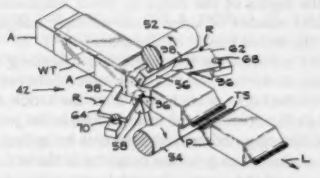
WRAPPING MACHINE

Michael R. Nack, and Gary M. Le Tourneau, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 1, 1976, Ser. No. 691,662

Int. Cl.[2] B65B *9/10*

U.S. Cl. 53—182 R **7 Claims**



1. In a horizontal form, fill and seal wrapping machine including means for continually unwinding and forming a strip of thermoplastic web material into a tube, means for depositing longitudinally spaced articles in said tube and cooperating

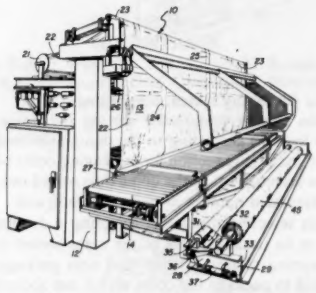
opposed pairs of rotary tucking means moving in the direction of web movement to engage and tuck web portions between said spaced articles, said rotary tucking means being rotatable about spaced pairs of axes lying in the same or substantially the same plane disposed transversely of the direction of movement of the web tube, the improvement in said tucking means comprising means for concurrently driving said tucking means to substantially simultaneously engage the tuck and opposed panels of the web tube, one pair of said tucking means being heated and provided with web severing means to, respectively, seal and sever the web tube along a line in said plane transverse to the direction of web movement and closely adjacent to said articles, the seal formed by said one pair of tucking means being generally in the form of a rectangle located adjacent said spaced articles and extending from one to the other edge of the web tube, and the other pair of said tucking means each consisting of integral fingers spaced a fixed distance laterally of each other and while tucking the opposed web tube portions toward each other said fingers being positioned on either side of said heated tucking means and thus straddling the web tube portion while sealing and severing occurs, said fingers of said other pair of tucking means in withdrawing from the tucked and sealed web tube avoid interference with the seal.

4,102,112

PACKAGING MACHINE

Henry B. Rose, Worchester, Mass., assignor to Curtis & Marble Corporation, Worcester, Mass.

Filed Dec. 8, 1975, Ser. No. 638,467
Int. Cl.[2] B65B *11/08*
U.S. Cl. 53—228 **5 Claims**



1. A packaging machine capable of use with elongated articles of varying lengths, comprising:

(a) a frame having an opening through which an article passes laterally from an input side to an output side,

(b) means supporting a plurality of rolls of wrapping material on the frame above the opening for independent unrolling, so that strips of material pass downwardly to form a plurality of bights in the opening in side-by-side relationship with a slight overlap between adjacent strips,

(c) means for advancing the article through the opening and into the bights of the strips to select automatically from the total number of strips a sub-multiple adequate to enclose the entire length of the article,

(d) means mounted on the frame and extending across the opening to form a joint to each other between two portions of the bight of each strip after the article has passed through the opening, the means to form the joint consisting of two opposed heating elements extending longitudinally of the opening on the output side thereof, the lower element and the upper element being relatively movable vertically to engage the strips after the article has passed through the opening, and

(e) take-up means to pull the strips downwardly but nonreversably a predetermined small amount after the joint has been formed, the take-up means holding the lower portions of the strips, so that the passage of the article through the opening causes it to engage the bight of the strips and to pull the strips downwardly only from the rolls, the take-up means acting on the material after the sealing operation to move the sealed joint to a position substantially below the level at which the said operation takes place, the take-up means comprising a ratchet mechanism to rotate one of a pair of pinch rolls fixed relative to the frame, the ratchet mechanism operating through an over-running clutch to rotate a roll for the accumulation of material from the lower end of the strips.

4,102,113

COVER FEEDING APPARATUS

Glenn F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems Inc., Louisville, Ky.

Filed Jun. 27, 1977, Ser. No. 810,027
Int. Cl.[2] B65B *7/28*
U.S. Cl. 53—366 **9 Claims**

1. An apparatus for supplying and locating a generally planar cover of selected peripheral configuration over a cooperative opening of similar configuraton of a moving container where the opening is surrounded by an outwardly directed generally horizontal cover receiving first flange where the first flange has an upwardly extending second flange so the cover is received on the first flange and within the second flange including:

(a) conveyor means to move said container along a selected first axis at selected first velocity with the opening directed upwardly;

(b) cover supply means to supply a cover to engage the first flange in a direction generally parallel to the direction of travel of the container from a location above the container;

(c) cover feed means to receive the cover from the cover supply means and feed the cover onto the first flange means along a second axis at an acute angle relative to the first axis at a selected second velocity where the velocity component of the cover, in a direction parallel to the first axis, is in excess of the first velocity so the cover means engages the first flange and moves along the first flange until the leading edge of the cover engages the front of the second flange and then feeds the balance of the cover to be fully received within the second flange.

4,102,114

COMBINATION LEVEL ADJUST AND SELF-TENSIONING BELT ASSEMBLY FOR MOWERS

Larry A. Estes, New Palestine, and Gerald D. Williams, Indianapolis, both of Ind., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 10, 1976, Ser. No. 713,252
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—15.2 **11 Claims**

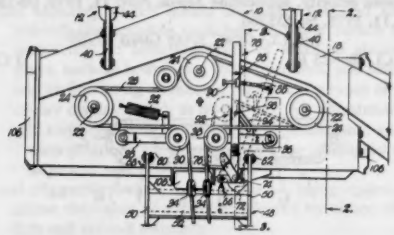
7. An implement adapted for shiftable mounting on a tractor or the like and having a belt and pulley drive train for coupling with a first driving pulley at a fixed position on the tractor, said implement including:

structure for selectively shifting the position of a second pulley in said belt and pulley drive train with respect to said implement;

height adjustment mechanism for raising and lowering a portion of the implement, whereby the distance between

said first pulley and the remainder of said belt and pulley drive train is altered;

linkage means operably interconnecting said structure and said mechanism, for shifting said second pulley by an



amount to compensate for alterations in the distance between said first pulley and the remainder of said drive train which occur during height adjusting movement of the implement.

4,102,115

COMPRESSED AIR SUPPLY ARRANGEMENT FOR A SERVICE CARRIAGE

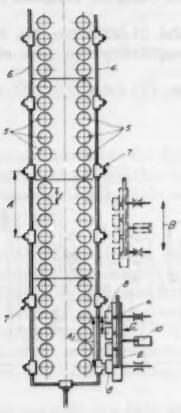
Zdenek Hemala; Guenter Nudinger, both of Kempten, and Gerhard Wehrmeister, St. Mang, all of Germany, assignors to Saurer-Allma GmbH, Kempten, Germany

Filed Sep. 27, 1976, Ser. No. 727,147

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 7531565

Int. Cl.[2] D01H *13/00, 9/10*

U.S. Cl. 57—34 R **6 Claims**



1. In a compressed air supply arrangement for a service carriage which is supported for travel along the side of at least one spinning, twisting or winding frame having a plurality of equally spaced spindles and a plurality of equally spaced work stations to be serviced and a compressed air system of which is supplied with compressed air from a stationary source of compressed air via a compressed air duct, the improvement comprising wherein said compressed air duct is stationarily arranged at each side of said frame and extends in the longitudinal direction of said frame and is connected to said compressed air source, said air duct having a plurality of automatically closing button-actuated valves connected in circuit therewith, each of said valves having a closure member, wherein the spacing of said valves corresponds to a whole integer multiple of the spindle spacing, and wherein there is provided on said service carriage a plurality of coupling heads arranged one behind another in the direction of movement of said carriage and mounted on a common slide and have a fixed spacing therebetween and means for supporting said common slide for movement transversely to the direction of movement of said carriage and at right angles to said air duct to effect the simultaneous movement of said plural coupling heads toward and away from said air duct, said coupling heads each having an opening member engageable with said closure member for opening said closure member of said valve when firmly engaged with said valve, said coupling heads being connected in fluid circuit to said compressed air system on said service carriage, wherein the spacing between said coupling heads is equal to said spindle spacing and wherein said spacing between said valves is greater by one spindle spacing than the total spacing between the endmost ones of said plurality of coupling heads.

4,102,116

METHOD AND APPARATUS FOR CONTROLLING A THREAD-JOINING OPERATION IN ROTOR SPINNING MACHINES

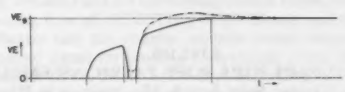
Josef Derichs; Hans Raasch; Ludwig Neuhaus; Dieter Langheinrich, all of Monchen Gladback; Helmut Schlösser, Viersen, and Erwin Baltsch, Nettetal, all of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Feb. 14, 1977, Ser. No. 768,496

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605978

Int. Cl.[2] D01H *15/00, 13/32*

U.S. Cl. 57—34 R **29 Claims**



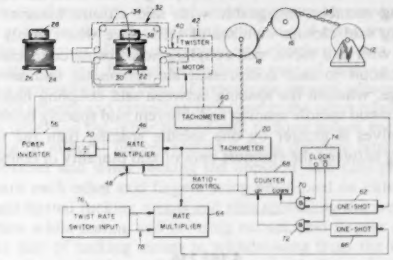
1. Method of controlling a thread-joining operation in a rotor-spinning machine having a rotor formed with a fiber-collecting channel, wherein a pulse proportional to the rotary speed of the rotor is applied to control a measure of the material being processed in the spinning operation which comprises automatically controlling spin feeding into the rotor of a quantity of fiber required for thread-joining and feeding the fiber beginning with withdrawal of a thread formed from the fiber, returning into the rotor the thread end to be joined and withdrawing the joined thread from the rotor during start-up of the rotor, the automatic control being in accordance with the pulse proportional to the rotary speed of the fiber-collecting channel of the rotor serving as control input variable for at least one of the fiber feed, the thread withdrawal, the starting-up of the spin feeding and the starting-up of the returning of the thread end.

11. Device for carrying out a method of controlling a thread-joining operation in a rotor-spinning machine having a rotor formed with a fiber-collecting channel comprising a control device associated with the rotor-spinning machine for controlling spin feeding into the rotor of a quantity of fiber required for thread-joining, and feeding of the fiber beginning with withdrawal of a thread formed from the fiber, and for return into the rotor of the thread end to be joined and withdrawal of the joined thread from the rotor, said control device being programmable during start-up of the rotor for effecting the control, the thread withdrawal velocity as well as the fiber feeding velocity being variable by a quantity proportional to the peripheral velocity of the fiber collecting channel of the rotor as control input variable.

4,102,117
WIRE TWISTING METHOD AND APPARATUS

Georg Christian Ernst Dornberger, Phoenix, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 25, 1976, Ser. No. 699,821
Int. Cl.[2] H01B *13/00*
U.S. Cl. 57—93 10 Claims



4. In an apparatus for twisting two wires to form a twisted pair having a capstan with a rotational speed representative of the linear speed of the twisted pair;

means for twisting the wires at an angular speed;

means responsive to the linear speed of the twisted pair for generating a series of pulses having a frequency proportional to the linear speed of the twisted pair;

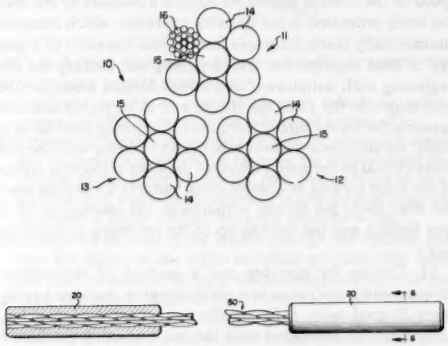
means responsive to the frequency of the pulses for driving the twisting means at a speed proportional to the frequency of the pulses, and

means for varying the ratio between the frequency of the pulses generated and the speed of the twisting means.

4,102,118
MULTI-PART WIRE ROPE FABRIC ASSEMBLY

Claud Ray Wheeler, Saint Joseph, Mo., assignor to Wire Rope Corporation of America, Inc., Saint Joseph, Mo.

Filed Mar. 16, 1977, Ser. No. 778,072
Int. Cl.[2] F16G *11/02;* D07B *1/00*
U.S. Cl. 57—144 5 Claims



1. An assembly comprising:

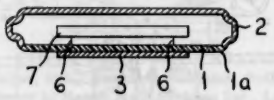
a length of multi-part wire rope fabric containing three to nine helically layed wire ropes;

a metal terminal fitting swaged onto each end of the length of multi-part fabric with a holding strength equal to or greater than the strength of the multi-part fabric; and

said metal terminals constituting axles for supporting and rotating the assembly, and each terminal is a metal cylindrical sleeve in which the fabric is axially centered.

4,102,119
ELECTRONIC TIMEPIECE

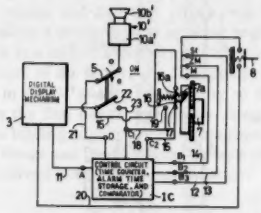
Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 9, 1976, Ser. No. 739,852
Claims priority, application Japan, Nov. 11, 1975, 50-135556; Nov. 11, 1975, 50-135560
Int. Cl.[2] G04C *3/00;* G04B *37/00*
U.S. Cl. 58—23 R 3 Claims

1. In an electronic timepiece: a display operative for displaying time in response to an electrical enabling signal applied thereto; a timepiece case housing said display, said timepiece case including a case back having an electrically insulative exterior portion; at least one electrode mounted on said electrically insulative exterior portion of said case back and positioned to inductively couple with an arm of a person wearing the electronic timepiece; and circuit means responsive to signals induced in said electrode from the arm of a person wearing the timepiece for developing an enabling signal and for applying said enabling signal to said display to enable said display when the timepiece is worn on the arm of a person.

4,102,120
ELECTRONIC ALARM CLOCK WITH A SERVICING ARRANGEMENT FOR TIME ADJUSTMENT

Hans Flaig, and Friedrich Assmus, both of Schramberg, Germany, assignors to Gebruder Junghans GmbH, Schramberg, Germany

Filed Jul. 13, 1976, Ser. No. 704,829
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1975, 7523854
Int. Cl.[2] G04C *9/00, 21/12*
U.S. Cl. 58—38 R 8 Claims



1. In an electronic alarm clock of the type including:

a digital display mechanism;

an alarm device;

a master circuit including:

an integrated control circuit having a counter for the time of day connected to said display mechanism, means for storing a wake-up alarm time, and means for comparing the wake-up alarm time to the time of day and being connected to the alarm device to activate the latter;

a main circuit connecting said counter and said display mechanism;

a gate-in circuit connecting said control circuit to said display mechanism for gating-in the wake-up alarm time onto said display mechanism;

manually operable selecting switch means connected to said master circuit for selecting a type of display to be adjusted;

a manually actuable alarm control switch for deactuating said alarm device;

a manually actuable triggering switch connected to said master circuit for adjusting the type of display selected by said switch means, the improvement wherein the improvement comprises:

said selecting switch means comprises first and second individually actuable switches, said first switch being connected for selecting types of wake-up alarm displays, such as hours, etc., for adjustment, and said second switch being connected for selecting types of time-of-day displays, such as hours, etc., for adjustment;

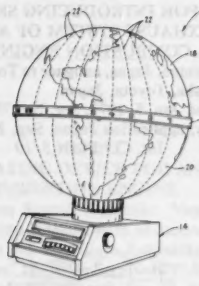
said switches being independently shiftable into various stop positions for selecting the type of display to be adjusted, and

said triggering switch, when actuated, being operable to adjust the value of a display selected by either of said first and second switches.

4,102,121
THREE DIMENSIONAL TIME PIECE

Robert W. Veazey, Lustercraft Plastics, Inc. 1818 S. Meridian, Wichita, Kans. 67213

Filed Nov. 8, 1976, Ser. No. 739,435
Int. Cl.[2] F21V *3/00*; G04B *19/22*; G09B *27/00*
U.S. Cl. 58—44 **4 Claims**



1. A three dimensional time piece for determing the correct time anywhere in the world and whether the selected location in the world at that moment is in daylight or darkness, the time piece comprising:

a base;

a world globe swivelly mounted on said base, said globe having 24 longitudinal lines equally spaced 15° apart on the surface of said globe and representing the time zones of the world, said globe made of translucent material for shining light therethrough;

a time band attached to the globe and mounted on the equator of said globe, said band indicating the 24 hours of the day;

a light attached to one side of a light shade, said light and said light shade disposed inside said globe, said shade longitudinally dividing the inside of said globe, the unlighted side of said globe representing nighttime in the world while the lighted side of said globe represents daytime;

an electrically driven synchronous motor attached to a drive gear for driving a pinion gear, said pinion gear turning a tubular shaft disposed inside said globe and attached to said time band and said light shade for turning said time band and said light shade one revolution per 24 hours;

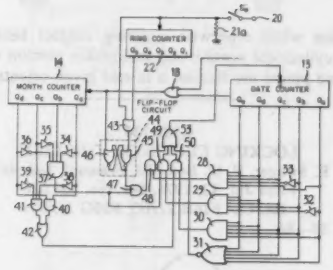
a time clock mounted inside said base for telling the present time at the location of the time piece; and

a dial indicating the month of a year, said dial attached to said base and said light shade, said dial driven by a second electrically driven synchronized motor one revolution per year, said dial by turning adjusts the tilt of said light shade and said light in said globe thereby changing the light intensity reflected on the northern and southern hemispheres of said globe and representing the inclination of the sun and the corresponding season of the year.

4,102,122
ELECTRONIC WATCH

Kojiro Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 4, 1976, Ser. No. 738,875
Claims priority, application Japan, Nov. 4, 1975, 50/132345
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 **4 Claims**



1. An electronic watch, comprising:

means for developing a repetitive timing signal having a repetition rate defining an interval of time;

counter means comprising a time counter, a day counter and a month counter receptive of said timing signal for counting the same and for developing counts respectively representing time of the day, day of the month, and the month, wherein said day counter includes means responsive to a control signal for limiting a maximum count of said day counter to 28, 29, 30 or 31 days according to the month;

date control means for developing said control signal and for applying the same to said day counter for limiting the maximum count of said day counter to 31 days during a long month, 30 days during a short month and 28 or 29 days during February; and

display means responsive to the respective counts of said counter means for displaying time of the day, day of the month, and the month.

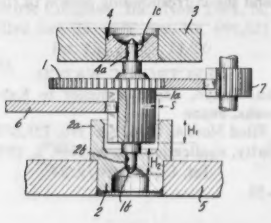
4,102,123
BEARING FOR A TIMEPIECE TRAIN

Yoshio Tatsumi; Eiichi Matsuura; Keikichi Takahashi, and Nobuo Tsukada, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 16, 1976, Ser. No. 751,073
Claims priority, application Japan, Dec. 17, 1975, 50-170839
Int. Cl.[2] G04B *29/00, 33/00, 31/00*
U.S. Cl. 58—140 R **2 Claims**

1. In a timepiece: a base plate; a wheel and pinion mechanism comprised of integral wheel and pinion portions having upper and lower shafts extending outwardly therefrom; and means mounting said wheel and pinion mechanism on said base plate for rotation in a given orientation relative to said base plate comprising means defining an opening in said base plate, and a bearing having a base portion fixedly inserted into said opening and an elongated hole in said base portion rotatably receiving therein said lower shaft of said wheel and pinion mechanism and having a cylindrical portion surrounding the outer periphery of said pinion portion and being spaced therefrom along their respective axial lengths a predetermined distance effective to enable said pinion portion to abut the inner wall of said bearing cylindrical portion when said wheel and pinion mechanism tilts on its lower shaft a predetermined amount from said

given orientation thereby preventing falling of said wheel and pinion mechanism and maintaining it substantially in said given



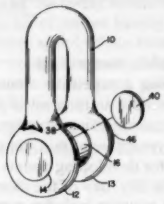
orientation while otherwise avoiding contact between said bearing cylindrical portion and said pinion portion when said wheel and pinion mechanism is in said given orientation.

4,102,124

LOCKING CLEVIS OR THE LIKE

William E. Swager, P. O. Box 656, Fremont, Ind. 46737

Filed Jul. 12, 1976, Ser. No. 704,628
Int. Cl.[2] F16B *21/00*; F16G *13/06*
U.S. Cl. 59—86 **18 Claims**



1. The combination of a support comprising a bent bar-like body having ends terminating in eyes provided by bores in each end, the opposed edges of said bores that face each other being chamfered to serve as a guide, and a closure pin or bolt axially slideable and rotatable in said eyes, at least one detent mounted for radial sliding movement in said pin and means radially biasing said detent through the sliding surface of said pin, a retaining area in at least one eye of said support adjacent to said detent and shaped to receive the end of said detent in biased position, locking said pin or bolt against axial movement while allowing rotation in said eyes, a slot cut through an outer surface of at least one of the eyes of said support communicating with the end of said detent in said retaining area and key means insertable in said slot to depress said detent radially releasing said pin for axial movement of said support.

4,102,125

HIGH TEMPERATURE GAS TURBINE

Helmut R. Schelp, Pacific Palisades, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 645,004, Dec. 29, 1975, Pat. No. 4,041,699.
This application Feb. 22, 1977, Ser. No. 773,869
Int. Cl.[2] F02C *7/00, 7/12*
U.S. Cl. 60—39.53 **12 Claims**

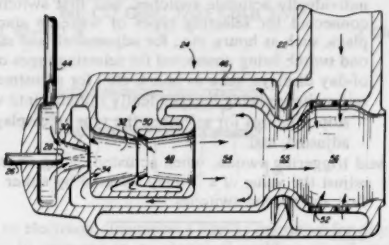
1. A combustor for a gas turbine engine said engine having a compressor and a turbine cooled by a fluid with a boiling point above standard atmospheric temperature and pressure, said combustor comprising:

a premixing chamber connected to a source of engine fuel and the cooling fluid outlet from said turbine;

a first mixing chamber for mixing and vaporizing the fuel and cooling fluid mixture from said premixing chamber;

a second mixing chamber operatively associated with said first mixing chamber and receiving the contents thereof for mixing the contents of said first mixing chamber with a portion of cycle fluid from said compressor;

a first combustion chamber connected to said second mixing chamber and receiving the contents thereof for gasification and primary combustion of the contents of said second mixing chamber; and



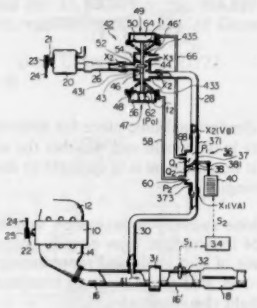
a second combustion chamber operably associated with said first combustion chamber and receiving the contents thereof together with the remainder of the cycle fluid from said compressor for secondary combustion therein.

4,102,126

APPARATUS FOR INTRODUCING SECONDARY AIR INTO AN EXHAUST SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 5, 1977, Ser. No. 756,859
Claims priority, application Japan, Sep. 21, 1976, 51/112419
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—276 **4 Claims**



1. An apparatus for introducing secondary air into an exhaust system of an internal combustion engine provided with a three-way catalytic convertor arranged in the exhaust system, said apparatus comprising:

air pump means driven by the engine;

pipe means which connects said air pump means with the exhaust system at a location situated upstream of said catalytic converter, for introducing an amount of secondary air into the exhaust system;

flow control valve means having a casing, arranged between said pipe means and having a valve member arranged in the casing for controlling the amount of secondary air introduced into the exhaust system from the air pump, said valve member being capable of being moved in one direction in order to decrease said amount of secondary air and capable of being moved in another direction opposite to said one direction in order to increase said amount of secondary air;

sensing means for sensing the atmosphere of the exhaust gas, arranged in the exhaust system in order to provide electrical signals indicating an excess air ratio λ of the exhaust gas;

operating means connected to said sensing means for moving said valve member in such a manner that said valve member is moved in said one direction for decreasing the amount of secondary air when an electrical signal indicating $\lambda > 1.0$ is transmitted from the sensing means to the operating means and that said valve member is moved in said other direction for increasing the amount of secondary air when another electrical signal indicating $\lambda < 1.0$ is transmitted from the sensing means, so that the atmosphere of the exhaust gas is controlled to a stoichiometric atmosphere in which λ is kept near 1.0, and;

pressure control valve means arranged between said pipe means at a location situated between said air pump means and said flow control valve means for keeping a predetermined constant difference between the pressure of the secondary air in said pipe means at a position located upstream of said flow control valve means and a pressure of the secondary air in said pipe means at another position located downstream from said flow control valve means,

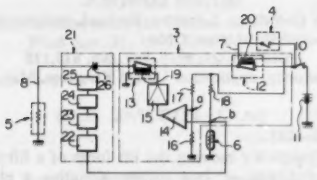
whereby a precise control of the atmosphere of the exhaust gas to said stoichiometric atmosphere by said flow control valve means is effectively attained.

4,102,127

CATALYZER HEATING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Junichi Saiki, Susono; Syouzi Watanabe, Numazu; Takehisa Yaegashi, and Tetsuro Nagano, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 15, 1977, Ser. No. 777,574
Claims priority, application Japan, Jan. 31, 1977, 52-8722
Int. Cl.² F02B *75/10*; F01N *3/15*
U.S. Cl. 60—284 **8 Claims**



1. A catalyzer heating device of an internal combustion engine having in its exhaust system a catalytic converter containing a catalyzer therein, said device comprising:

a power source;

means in said catalytic converter for heating said catalyzer;

a first detecting means for providing a first signal indicating that the temperature of the engine is below a predetermined level;

a second detecting means for providing a second signal indicating the temperature of said catalyzer, and;

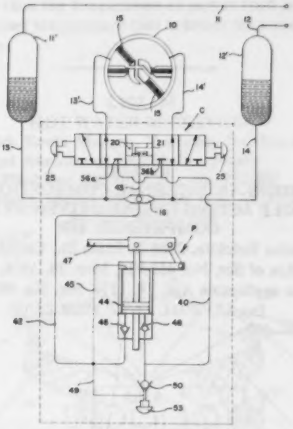
control means for establishing an electrical connection between said power source and said heating means in response to said first and said second signals when the temperature of the engine is below a predetermined level and when the temperature of said catalyzer is below a predetermined level.

4,102,128

HAND PUMP SYSTEM FOR HYDRAULIC MOTOR

Jon L. Shafer, Houston, Tex., and William K. LeBlanc, Mansfield, Ohio, assignors to Shafer Valve Company, Mansfield, Ohio, a part interest

Filed Jul. 1, 1977, Ser. No. 812,140
Int. Cl.² F15B *20/00, 13/09*
U.S. Cl. 60—400 **14 Claims**



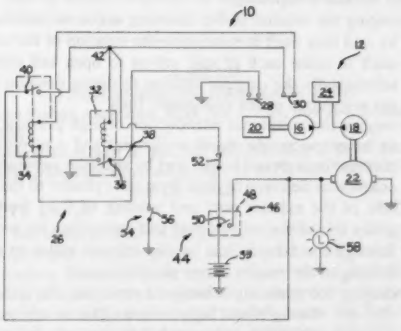
1. In combination with a hydraulic motor operable in opposite directions by pressure storage tanks when subjected alternately to supply and discharge pressures, a hand piston pump, a control valve normally connecting said motor and storage tanks and having shiftable elements for connecting said hand pump selectively with said storage tanks to move said motor in either direction, and conduit means for connecting both sides of said pump piston to pressure selectively from either of said tanks and for returning said elements to normal position, when said tanks are subjected to supply and discharge pressures.

4,102,129

CONTROL APPARATUS

Richard J. Maes, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 1, 1977, Ser. No. 812,094
Int. Cl.² F15B *20/00*
U.S. Cl. 60—403 **6 Claims**



1. Control apparatus for an apparatus having first and second mechanisms, comprising:

first means for automatically, controllably energizing said

second mechanism in response to a preselected condition of said first mechanism; and

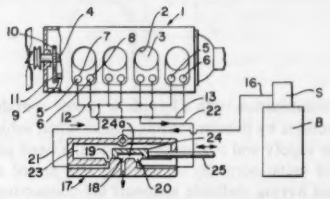
second means for selectively, controllably energizing said second mechanism independently of said first means and independently of the condition of said first mechanism and for controllably energizing said second mechanism in response to the preselected condition of said first mechanism.

4,102,130

CONVERTING AN INTERNAL COMBUSTION ENGINE TO A SINGLE ACTING ENGINE DRIVEN BY STEAM OR COMPRESSED AIR

Harry Charles Stricklin, 2004 E. 224th St., Euclid, Ohio 44117

Continuation of Ser. No. 455,921, Mar. 28, 1974, abandoned.
This application Apr. 19, 1976, Ser. No. 668,749
Int. Cl.[2] F01L *13/02*; F01B *23/02*
U.S. Cl. 60—407 **3 Claims**



1. A method of converting to a single acting, reversible steam engine a four cycle internal combustion engine which includes an engine block, a cylinder therein having an intake port and an exhaust port, an inlet valve and an exhaust valve for said ports, respectively, a piston reciprocable in the cylinder, a crankshaft driven by the piston, a cam shaft, timing gears interconnecting the crankshaft and cam shaft so that the cam shaft is driven by the crankshaft in a ratio of one revolution of the cam shaft to two revolutions of the crankshaft, cams on said cam shaft for the valves, respectively, and arranged one cam for each valve for lifting and lowering the associated valve so as to open and close its associated port in and for a four cycle operation of the engine;

said method comprising:

changing the relation of the camming action on said valves by said cam shaft in relation to the rotation of the crankshaft to cause each of said valves to open and close in substantially the original relation to piston position once per revolution of the crankshaft; then

arranging for continuous introduction of high pressure fluid to the entrance side of said intake port and controlling its passage through said intake port by said inlet valve and for continuous delivery of fluid from the cylinder to the inlet side of the exhaust port and venting of fluid from the outlet side of the exhaust port and controlling the venting through the exhaust port by said exhaust valve, to effect driving of the engine in one direction; and

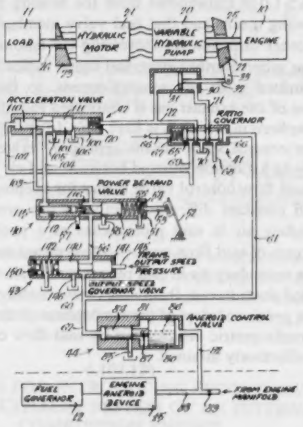
arranging for manually selectively reversing the introduction and venting of said high pressure fluid to said ports in a manner to effect continuous introduction of the high pressure fluid to the outlet side of the said exhaust port and the continuous venting of the entrance side of the said inlet port, thereby to cause driving of the engine in a direction which is the reverse of said one direction.

4,102,131

INTEGRATED TRANSMISSION-ENGINE CONTROL

David W. Reynolds, Huxley, and Frederic W. Pollman, Ames, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 5, 1977, Ser. No. 794,094
Int. Cl.[2] F16D *31/02*; F15B *11/02*
U.S. Cl. 60—431 **22 Claims**



1. An integrated transmission-engine control including a transmission having a pump drivable by an engine, a fluid pressure operated ratio governor means for the transmission, fluid pressure operated means for controlling the supply of fuel to an engine, a power demand valve for converting a particular power demand to a particular fluid pressure primary control signal, and means for applying said primary control signal to the ratio governor means in opposition to a signal representing engine speed to set the transmission ratio to establish engine speed and to the fuel supply controlling means to establish a fuel setting to match engine horsepower to engine speed for minimum fuel consumption.

4,102,132

MOTOR CONTROL

Norman H. G. Palmer, Leicester, England, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 13, 1977, Ser. No. 815,118
Claims priority, application United Kingdom, Mar. 22, 1977, 12055/77
Int. Cl.[2] F15B *11/02, 11/16*
U.S. Cl. 60—433 **24 Claims**

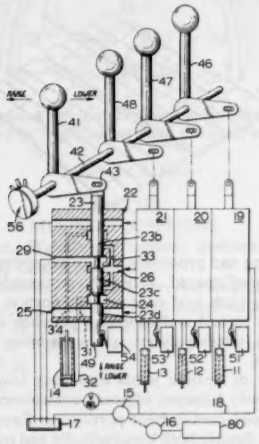
1. In a system for moving the lift forks of a lift truck in a plurality of directions, said system including a plurality of hydraulically operable means one for each direction of movement, a fluid pump, a valve for each hydraulically operable means, a manually-operable lever operatively associated with each of said valves for moving said valves from neutral to operative position, said valves being serially connected downstream of said pump for serial flow from said pump through all of said valves when all of said valves are in neutral position, each said valve being operable when in operative position to communicate pump flow therethrough to the hydraulically operable means associated therewith and to cut off pump flow to the valves downstream thereof, an electric motor drivingly connected to said pump, a battery and electronic switch means connected in series with said motor and battery, the improvement comprising:

(a) oscillator means for closing said electronic switch means on each cycle of operation of said oscillator means,

(b) means for opening said electronic switch means after each closure thereof by said oscillator means,

(c) signal-responsive means for setting the ratio of closed to open time of said electronic switch means during a cycle of operation of said oscillator means in proportion to the magnitude of a signal applied to said signal-responsive means,

(d) signal-generating means for generating a plurality of signals of predeterminable magnitude, each of said signals being associated with a different one of said valves,



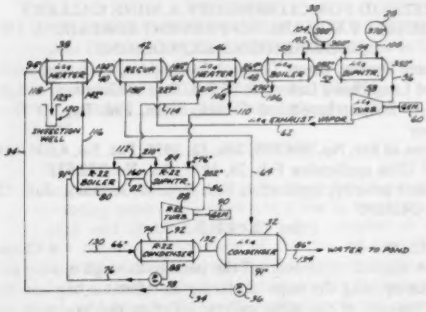
(e) means responsive to movement of each of said valves from neutral to operative position for applying the signal associated with said valve to said signal-responsive means and for inhibiting the application to said signal-responsive means of a signal associated with any downstream valve,

(f) said signal-generating means including means for continuously varying the magnitude of one of said signals in proportion to the magnitude of movement from neutral position of the valve associated with said signal.

4,102,133
MULTIPLE WELL DUAL FLUID GEOTHERMAL POWER CYCLE

James Hilbert Anderson, 1615 Hillock La., York, Pa. 17403

Filed Apr. 21, 1977, Ser. No. 789,369
Int. Cl.² F03G *7/04*
U.S. Cl. 60—641 **40 Claims**



1. The method of producing power from geothermal energy which comprises:

providing first and second hot geothermal fluids from respective first and second geothermal wells, said first geothermal fluid being provided at a higher temperature than said second geothermal fluid,

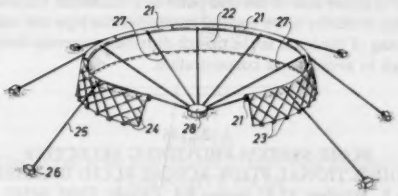
transferring heat energy from said first geothermal fluid in a first heat exchange step into a power fluid cycle of the type which is adapted to produce power by power fluid expansion, so as to raise the temperature of power fluid in said cycle to a first temperature, and

transferring heat energy from said second geothermal fluid in a second heat exchange step into said power fluid cycle so as to raise the temperature of power fluid in said cycle to a second temperature that is lower than said first temperature.

4,102,134
HOT WATER RESERVOIR

Peter Heinrich Erwin Margen, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Dec. 23, 1976, Ser. No. 753,947
Claims priority, application Sweden, Dec. 23, 1975, 7514624
Int. Cl.² E02B *3/00*
U.S. Cl. 61—1 F **8 Claims**



1. A hot water reservoir comprising:

a plurality of buoys floating on the surface of a body of water and enclosing a limited area thereof;

a substantially vertical wall of at least two sheets of flexible material impervious to water, said sheets fastened at their upper ends to said buoys and having stagnant water therebetween;

weights fastened to the lower edge of said wall to maintain the wall in its substantially vertical position;

cables extending between the buoys and the weights to reinforce said wall;

anchoring wires extending from the buoys toward the interior of the reservoir adapted to neutralize the tension on the wall of the reservoir caused by the difference in level between the hot water inside the reservoir and the cold water outside the reservoir; and

a floatable sheet operatively disposed on the hot water surface to reduce evaporation and loss of heat from the hot water.

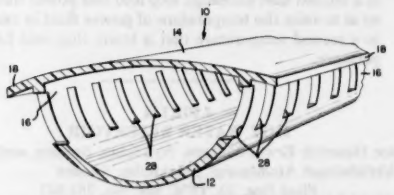
4,102,135
UNDERGROUND DRAINAGE PIPE

Robert Sinbad Auriemma, R.D. No. 1, P.O. Box 104, Bethel, Pa. 19507

Continuation-in-part of Ser. No. 682,492, May 3, 1976, Pat. No. 4,065,925. This application Apr. 1, 1977, Ser. No. 783,767
Int. Cl.² E02B *11/00*
U.S. Cl. 61—10 **4 Claims**

1. An underground drainage pipe formed of a length of extruded stiffly flexible plastic and adapted to withstand vertical loading forces without stress concentration including in transverse cross section, a generally U-shaped trough opening upwardly with lips at the upper trough edges, the horizontal width of the trough between the lips being approximately twice the vertical height of the trough from the bottom thereof to a line joining the lips; a series of spaced drainage openings formed through the thickness of each lip; a generally flat roof overlying the trough and integrally joining the trough beyond

the lips so that the roof and trough are substantially D-shaped in transverse cross section, roof extensions projecting outwardly of the trough beyond the lips to form protective wings; said lips joining said generally flat roof at an angle of approximately 90°, the circumferencial length of the roof between the lips being substantially less than the circumferencial length of the trough between the lips, said pipe being symmetrical to



either side of a plane passing through the mid points of the trough and roof, and said trough having a minimum thickness at its mid point and increasing in thickness smoothly and gradually to either side of the mid point to a maximum thickness at the lips whereby upon vertical loading of the pipe the uniform tapering of thickness in the trough distributes stresses along the trough to avoid stress concentration.

4,102,136

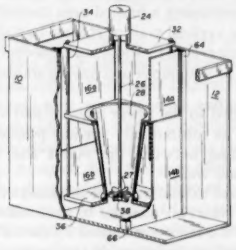
PUMP SYSTEM PROVIDING SELECTIVE DIRECTIONAL FLOW ACROSS FLUID BARRIER

John L. Winther, 12 El Sereno Rd., Orinda, Calif. 94563

Filed May 4, 1977, Ser. No. 793,677

Int. Cl.² E02B *7/20*

U.S. Cl. 61—29 **9 Claims**



1. In a combination a pump and pump manifolding system for producing selective directional liquid flow across a barrier between at least a plurality of adjacent fluid reservoirs, said system comprising: a housing for placement in said barrier having at least two sidewalls, one of said sidewalls forming a fluid-tight barrier with one reservoir and the other of said sidewalls forming a fluid-tight barrier with the other of said reservoirs; said housing divided into upper and lower fluid chambers, said lower fluid chamber adapted for the inflow of fluid to be pumped and said upper fluid chamber adapted for the outflow of fluid to be pumped; a low head pump having an intake communicated to said lower chamber and a discharge communicated to said upper chamber, each of said sidewalls including a first opening portion for establishing fluid communication between the lower chamber of said housing and said adjacent reservoir and a second opening portion for establishing fluid communication between said upper chamber and said fluid reservoir whereby selective manipulation of a first opening portion in one sidewall and a second opening portion in said other sidewall permits said selective directional flow between said adjacent reservoirs.

4,102,137

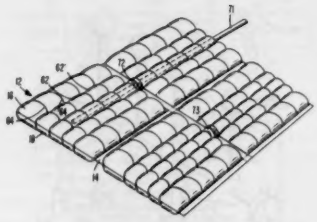
COATING AND PROTECTIVE DEVICE

Mauricio Porraz, Gutenberg 47, Mexico 5, Mexico, and Margret Klose, Zollikofen, Switzerland, assignors to Mauricio Porraz, Mexico City, Mexico

Filed Dec. 6, 1976, Ser. No. 747,749

Int. Cl.² E02B *3/12*

U.S. Cl. 61—38 **7 Claims**



1. A coating and protection device comprising:

a plurality of spaced, generally rectangular containment portions, each said containment portion having spaced first and second walls forming pouches which receive a flowable, settable slurry, said walls being of woven construction;

a plurality of flexible joints extending longitudinally and transversely between adjacent containment portions and joining said containment portions to form a flexible mat which is flexible both longitudinally and transversely after receipt and setting of a slurry, said flexible joints being formed by interweaving said first and second walls;

a plurality of interconnecting passages in said flexible joints extending between adjacent ones of said pouches, said interconnecting passages being structured to receive injection pipes insertable through a plurality of said pouches and said interconnecting passages to serially feed the slurry to said pouches as said injection pipes are withdrawn through said pouches and said interconnecting passages;

a plurality of reinforcing guys, each of said guys having a portion extending between said first and second walls and further having a portion woven integrally with said first and second walls; and

reinforcing strands integrally formed with said walls and being disposed generally perpendicularly to said portions of said reinforcing guys woven integrally with said walls.

4,102,138

METHOD FOR CLOSING OFF A MINE GALLERY ESPECIALLY FOR USE TO PREVENT SPREADING OF UNDERGROUND EXPLOSIONS

Raimund Dreker, Essen; Gerhard Endras, Augsburg, and Bernhard Langerbein, Lunen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 585,806, Jun. 11, 1975, Pat. No. 4,036,024.

This application Feb. 28, 1977, Ser. No. 772,631

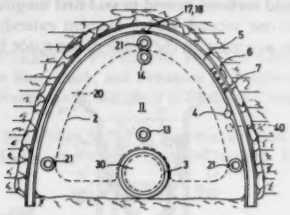
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428290

Int. Cl.² E21F *5/00*

U.S. Cl. 61—42 **4 Claims**

1. A method of closing off the passage through a mine gallery, comprising the steps of placing an inflatable bag into the open passage of the mine gallery; inflating the bag with gas under pressure until the inflated bag extends transversely through said passage and engages with the peripheral surface thereof the inner surface of the mine gallery to completely seal the passage; subsequently pumping into the bag a flowable material which quickly hardens after being filled into the bag while permitting at the same time the gas to escape from the

interior of the bag through an overpressure valve arranged at the highest point of the inflated bag, until the bag is completely filled with said hardenable material to thus form, after harden-



ing of the material, a solid wall extending across the passage of the mine gallery in engagement with the inner surface of the latter.

4,102,139

MINING EQUIPMENT

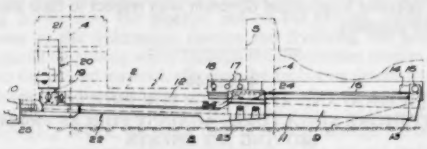
Malcolm Wake, Wakefield, England, assignor to Fletcher Sutcliffe Wild Limited, England

Filed May 21, 1976, Ser. No. 688,938

Claims priority, application United Kingdom, May 22, 1975, 22142/75; May 22, 1975, 22140/74

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **16 Claims**



1. A self-advancing, hydraulically powered mine roof support apparatus comprising a roof support means; a base means for supporting said roof support means on a mine floor; at least one advancing piston and cylinder unit pivotally carried by said base means; a relay bar having first and second ends, said first end being rigidly connected to said advancing unit, said second, free end adapted to be attached to a mine face conveyor; and a lifting ram connected between said roof support means and said relay bar in proximity to a forward end of said mine roof support means, said lifting ram being operative to lift one of said advancing unit and the forward end of said base means to avoid obstructions located on the mine floor.

4,102,140

SELF-ADVANCING MINE ROOF SUPPORTS

Archelaius Dawson Allen, Leyland, England, assignor to Gullick Dobson Limited, England

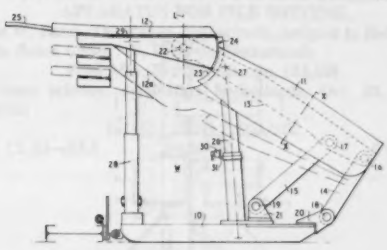
Filed Nov. 14, 1975, Ser. No. 632,013

Claims priority, application United Kingdom, Jul. 19, 1975, 30347/75

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **22 Claims**

1. A mine roof face support system comprising a plurality of self-advancing mine-roof supports in a row in front of a mine-face, each said mine-roof support being coupled to a face conveyor running transversely of the row of supports and including ram means for advancing that support relative to the face conveyor and the face conveyor relative to that support, and each said mine-roof support comprising a one-piece rigid base located rearwardly of said face conveyor, a roof-engaging canopy extending over the face conveyor and a forward part of the base, a shield inclined upwardly and forwardly from the rear of the base to the rear of the canopy, first pivot means coupling an upper part of the shield to the rear of the canopy, second pivot means coupling a lower part of the shield to the rear of the base, first hydraulically extensible prop means operatively positioned between said base and said shield, and second hydraulically extensible prop means operatively positioned between said base and said canopy, the first and second hydraulically extensible prop means being spaced to afford



between them a covered access running parallel with and rearwardly of the face conveyor, and the first pivot means including a linkage prescribing movement of the lower part of the shield over the base to maintain a constant vertical canopy tip position.

4,102,141

METHOD OF AND EQUIPMENT FOR USE IN DRIVING COMPOSITE PILES

Richard L. Ingalls, South Portland, Me., assignor to H. B. Fleming, Inc., South Portland, Me.

Filed Nov. 11, 1976, Ser. No. 741,133

Int. Cl.[2] E02D *5/26*

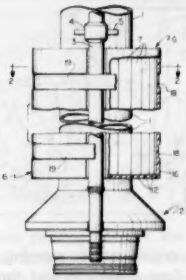
U.S. Cl. 61—53.5 **3 Claims**

1. Apparatus for embedding a tubular metal pile section in a wooden pile section and thereafter driving the two sections into the ground a desired distance, said apparatus comprising a mandrel member insertable in the metal tubing and provided with at least one transversely disposed bore, and means for locating the mandrel in driving engagement with the top edge of the tubular section and for spacing the bottom end of the mandrel a predetermined distance above an exposed end of the wooden pile section corresponding to the distance that the lower end of the tubular metal section is to be embedded, said means including a pin member received through said bore for bearing against the top edge of the metal pile section.

4,102,142
UNDERWATER RISER BUOYANCY

George Lee, Monterey Park, Calif., assignor to Hitco, Irvine, Calif.

Filed Dec. 30, 1976, Ser. No. 755,660
Int. Cl.[2] E21C *19/00;* E21B *43/01*
U.S. Cl. 61—86 10 Claims



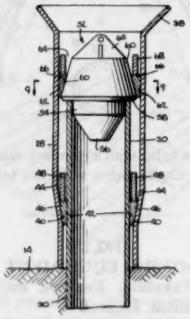
1. In an underwater pipe assembly, such as a subsea riser, which requires buoyancy control, the combination of
a length of pipe to be incorporated in the assembly;
at least two elongated buoyancy members each comprising a plurality of elongated rigid hollow tubular elements disposed side-by-side and a liquid-tight shell enclosing said tubular elements as a group, said tubular elements each being in the form of a continuous length having a uniform transverse cross-section and each comprising
an inner wall,
an outer wall, and
two flat outwardly divergent side walls,
the complementary side walls of adjacent pairs of said tubular elements being in face-to-face engagement,
said shell having an inner wall which extends over said inner walls of all of said tubular elements, is transversely arcuate and embraces said pipe;
said divergent side walls of said tubular elements lying in respective planes which are radial with respect to said pipe; and
securing means extending around the combination of said buoyancy members and said pipe and securing the buoyancy members to the pipe.

4,102,143
ANCHORING OF STRUCTURES

Lindsey J. Phares, Sugar Land, and George J. Gendron, Houston, both of Tex., assignors to Raymond International Inc., Houston, Tex.

Filed Jan. 13, 1977, Ser. No. 759,028
Int. Cl.[2] E02B *17/00*
U.S. Cl. 61—94 44 Claims

1. Apparatus for anchoring a structure, said apparatus comprising an elongated anchor member adapted to be anchored at a given location, a tubular sleeve member adapted to be affixed to said structure and to surround said anchor member, first and second wedge type locking assemblies interposed between said sleeve and anchor members at longitudinally spaced apart locations therealong to prevent relative movement of said sleeve member in either a first or an opposite longitudinal direction with respect to said anchor member, the first wedge type locking assembly comprising means defining a first surface region on said sleeve member which faces and is inclined toward a corresponding first surface region on said anchor member as said surfaces extend in said first longitudinal direction, at least one first wedge element extending into and configured in accord with shape of the space between said first surface regions for locking same together when said first wedge element is moved in said first direction, the second wedge type locking assembly comprising means defining a second surface region on said anchor member which faces, and is inclined toward, a corresponding second surface region on said sleeve member as said surfaces extend in said first longitudinal direction, at least one second wedge element extending into and configured in accord with the shape of the space between said

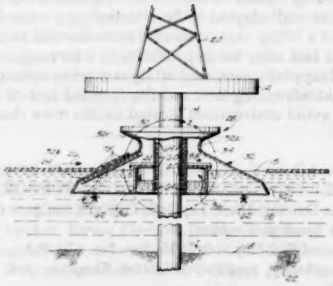


second surface regions when said second wedge element is moved in said first direction, means biasing said first and second wedge elements in said first longitudinal direction and the corresponding surface regions being held against movement in said opposite longitudinal direction with respect to their associated members.

4,102,144
METHOD AND APPARATUS FOR PROTECTING OFFSHORE STRUCTURES AGAINST FORCES FROM MOVING ICE SHEETS

Edward O. Anders, Houston, Tex., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed May 31, 1977, Ser. No. 801,551
Int. Cl.[2] E02B *15/02;* B63B *35/44*
U.S. Cl. 61—103 46 Claims



1. A method for protecting a marine structure fixed in a body of water from forces exerted by sheet ice moving across the water surface comprising the steps of:
placing adjacent the marine structure a shield surface which slopes away from the structure in a direction opposite to the direction of ice movement from the structure proceeding from an upper portion above the water surface to a lower portion disposed below the water surface,
allowing a portion of the sheet ice to move substantially into contact with the shield surface so that a submerged portion of the shield surface is disposed below the ice,
raising the shield surface to an elevated position thereof to cause the surface to lift the ice and to break pieces therefrom, and

moving the shield surface in the elevated position thereof to a position thereof downstream from the marine structure relative to the direction of ice movement.

4,102,145

ANCHORING A PIPELINE TO THE GROUND

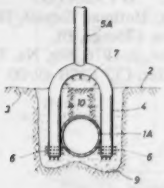
Johannes van Steveninck, and Johannes R. Hogervorst, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 31, 1977, Ser. No. 801,964

Claims priority, application United Kingdom, Jun. 3, 1976, 22985/76

Int. Cl.² F16L *1/00*

U.S. Cl. 61—105 **6 Claims**



1. A method of anchoring a pipeline by securing an anchoring device to the ground, said anchoring device being provided with fluidization nozzles, comprising placing the anchoring device over the pipeline and on the ground, supplying water to the fluidization nozzles and fluidizing the ground material by passing water through the fluidization nozzles and into the ground material, allowing the anchoring device to sink into the fluidized ground material and anchor the pipeline, at least some of the ground material remaining in contact with the anchoring device, passing a fluid substance through the fluidization nozzles and into the interstices of the ground material about the anchoring device and allowing the fluid substance to solidity and secure the anchoring device to the ground.

4,102,146

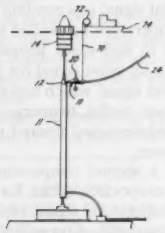
METHOD OF AND APPARATUS FOR HANDLING HOSE UNDERWATER

David S. Dietrich, Magnolia, Tex., assignor to Sofec, Inc., Houston, Tex.

Filed May 25, 1977, Ser. No. 800,313

Int. Cl.² F16L *1/00;* **B23Q** *3/00*

U.S. Cl. 61—110 **11 Claims**



1. An apparatus for moving a hose into position for connection to an underwater pipe, comprising

a saddle having a hose receiving portion positioned in an underwater location and near the end of said underwater pipe,

means for pulling a hose down in the water,

said pulling means being in a preselected position with respect to said saddle, and

means for moving said saddle to bring said saddle in approximate parallel relation to said hose,

said saddle moving means pivoting said saddle about a vertical axis and about a horizontal axis transverse to the axis of said underwater pipe and being positioned to move said hose into axial alignment with said underwater pipe.

4,102,147

SUBMERSIBLE POSITIONING AND GUIDING APPARATUS FOR PILE DRIVING

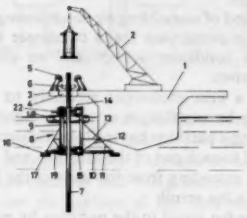
Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep NV, Rijswijk, Netherlands

Filed Mar. 3, 1976, Ser. No. 663,609

Claims priority, application Netherlands, Oct. 13, 1975, 7512022

Int. Cl.² E02D *7/00, 7/02*

U.S. Cl. 61—53.5 **5 Claims**



1. Apparatus for guiding and supporting a pile during submerged pile-driving by means of a pile-driving hammer to be placed on top of the pile, said apparatus comprising: a frame assembly having at least three radially projecting arms, said arms having footpads at the outer ends thereof for supporting the apparatus on the ocean floor, said frame assembly having at least three vertically extending posts placed at equal distances from each other around a central axis of the apparatus and at equal distances from said axis, said frame defining a guide passage for a pile proximate the lower ends of the posts, said frame carrying radially movable inwardly extending guide members proximate the upper ends of the posts for guiding said pile and means attached to said frame assembly for submerging and raising said apparatus in water.

4,102,148

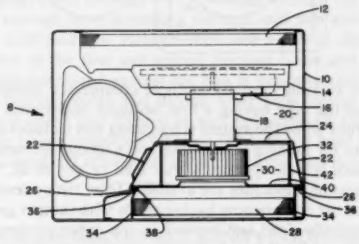
AIR CONDITIONING APPARATUS AND METHOD OF ASSEMBLING SAME

Richard E. Matthews, E. Syracuse, and Theodore S. Bolton, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 2, 1977, Ser. No. 793,028

Int. Cl.² F25B *45/00;* **F25D** *23/12, 19/00*

U.S. Cl. 62—77 **23 Claims**



1. In an air conditioning unit containing a base pan, a condenser fan, an evaporator fan and being divided into an evaporator section and a condenser section improved apparatus for easy assembly said improved apparatus comprising:

a partition for dividing the unit into an evaporator section and a condenser section having a body, two resilient legs one attached to each end of the partition body and two resilient arms extending inward from the ends of the leg sections;

a fan scroll having a scroll body and an air guide surface whereby the arms of the partition may be stressed into a displaced position engaging the scroll body holding the scroll body in place with the air guide surface tight to the partition; and

a heat exchanger assembly fixed to the base pan and having attached flanges extending therefrom so that when the arms of the partition are stressed into a displaced position the partition arms engage the flanges whereby the stressed partition holds the partition tightly to the tube sheet flanges and further holds the scroll to the partition and the tube sheet.

10. A method of assembling air conditioning units containing a base pan, an evaporator fan, a condenser fan and being divided into a condenser section and an evaporator section which comprises:

mounting a heat exchanger assembly to a base pan, the assembly having flanges extending therefrom;

constructing a partition having two resilient leg sections, one attached to each end of the partition, and two resilient arm sections extending from the ends of the leg sections;

providing a fan scroll;

affixing the fan scroll to the partition by engaging the resilient partition arms against the fan scroll to create an internal stress within the partition, said internal stress holding the partition to the fan scroll; and

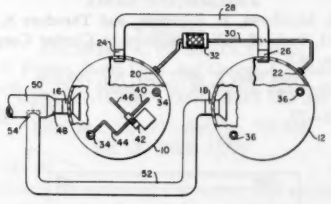
sliding the partition arm sections of the now combined fan scroll and partition over the heat exchanger assembly flanges so that the partition is further displaced to create additional internal stresses holding the partition and fan scroll to the heat exchanger assembly.

4,102,149

VARIABLE CAPACITY MULTIPLE COMPRESSOR REFRIGERATION SYSTEM

Thomas F. Conley, Staunton, Va.; Ernest F. Gylland, Jr., Seattle, Wash., and George E. Steele, Staunton, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1977, Ser. No. 789,909
Int. Cl.[2] F25B *41/00, 31/00*
U.S. Cl. 62—196 A **4 Claims**



1. In a variable capacity multiple compressor refrigeration system of the type having a first hermetic compressor which always runs while the system is operating and includes unloading means for running at half load, and a second hermetic shell compressor which operates at full load or not at all, so that four operating capacities are available from the system:

each of the compressors having shells with suction gas inlets identically sized and located on the upper portion of the shells, with oil equalizer line ports identically sized and located on the lower portion of the shells near the level of the normal oil level during operation, and with gas exchange line ports identically sized and located on the upper portion of the shells;

first suction conduit means for connecting the inlet port of said first compressor to the system suction gas return line, the suction gas return line having a larger diameter than the diameter of said inlet ports;

second suction conduit means connecting the inlet port of said second compressor to the system suction gas return line;

an oil equalizer line connecting said oil equalizer line ports;

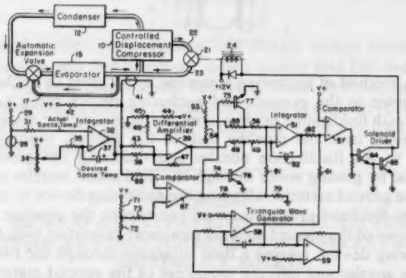
a gas exchange line connecting said gas exchange line ports, said gas exchange line functioning to pass suction gas from the shell of said first compressor to said second compressor when said second compressor is running, and said first compressor is running in an unloaded condition, to promote cooling of said first compressor in its unloaded condition.

4,102,150

CONTROL SYSTEM FOR REFRIGERATION APPARATUS

Kenneth John Kountz, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1976, Ser. No. 737,233
Int. Cl.[2] F25B *49/00*
U.S. Cl. 62—209 **14 Claims**



1. In a refrigeration system where refrigerant flows through a closed vapor cycle refrigeration circuit having an evaporator, a controlled displacement compressor, a condenser and an automatic expansion device, a control system for regulating the refrigerant flow rate through the evaporator in order to maintain a substantially constant desired temperature in a space to which cooled air is supplied by the refrigeration system, comprising:

means, including a first temperature sensor located in the space to be temperature controlled, for providing a space temperature signal representing the actual ambient temperature therein;

means, including an adjustable device, for providing a temperature set point signal representing the desired temperature for the temperature controlled space;

means responsive to said space temperature signal and to said temperature set point signal for providing a temperature control point signal which represents a desired evaporator refrigerant outlet temperature, referenced with respect to a predetermined desired minimum evaporator outlet temperature;

means, including a second temperature sensor positioned adjacent to the evaporator outlet, for providing an evaporator outlet temperature signal representing the actual temperature of the refrigerant at the evaporator outlet;

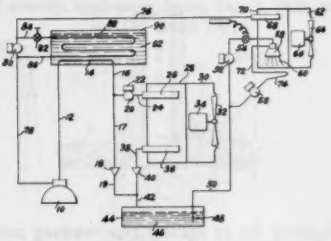
means responsive to said temperature control point signal and to said evaporator outlet temperature signal for providing an error signal which varies as a function of the difference between the desired control point temperature and the actual evaporator outlet temperature;

and means responsive to said error signal for varying the displacement of the controlled displacement compressor to modulate the refrigerant flowing through the evaporator to establish the evaporator outlet temperature at said control point, thereby to maintain the controlled space at the desired temperature.

4,102,151
HOT GAS DEFROST SYSTEM WITH DUAL FUNCTION LIQUID LINE

Daniel Kramer, Yardley, Pa.; Israel Kramer, Trenton, N.J.; Harold Kramer, Morrisville, Pa.; Lawrence Board, Dallas, Tex.; Ram Chopra, and William Micai, both of Trenton, N.J., assignors to Kramer Trenton Company, Trenton, N.J., by said Israel Kramer, Harold Kramer, Larry Board, Ram Kumar Chopra and William Micai

Continuation of Ser. No. 678,477, Apr. 20, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,289
Int. Cl.² F25B *47/00*
U.S. Cl. 62—278 **20 Claims**



1. An improved refrigeration system having refrigeration periods and defrost periods comprising a compressor having an inlet connection and a discharge connection; air cooled condenser means for exposure to summer and winter conditions, said condenser means having an inlet and an outlet; a first conduit connecting the compressor discharge and the condenser inlet; frosting and defrosting evaporator means having at least one inlet and a suction outlet; expansion means for feeding refrigerant liquid to an evaporator inlet; means for holding and conveying liquid refrigerant from the condenser outlet to the expansion means; a suction conduit connecting said suction outlet with the compressor inlet; wherein the improvement comprises:

(a) first valve means positioned in the first conduit for allowing flow to the condenser inlet during refrigerating periods and for positively preventing said flow during defrost periods;

(b) a hot gas conduit connecting the liquid conduit means with an evaporator inlet;

(c) second valve means for allowing flow in said hot gas conduit during defrost periods and for preventing said flow during refrigeration periods;

(d) a bypass conduit connecting the first conduit with the liquid conduit means;

(e) third valve means in the bypass conduit for allowing hot gas flow therethrough when said first valve means prevents flow to the condensor inlet and for preventing flow therethrough when said first valve means allows flow to the condenser inlet;

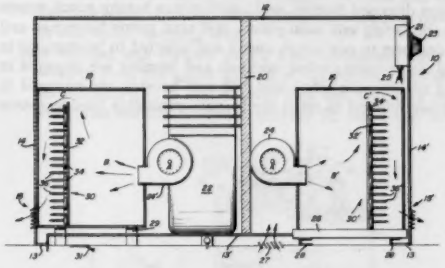
whereby hot gas is caused to positively bypass the condenser and to flow in the liquid conduit means during defrost periods.

4,102,152
HEAT EXCHANGE DEVICE FOR AIR CONDITIONERS

Darrell W. Covault, 30 Green Ct., Bridgeton, Mo. 63044

Filed Aug. 27, 1976, Ser. No. 718,420
Int. Cl.² F25B *39/04;* F28F *1/32*
U.S. Cl. 62—428 **2 Claims**

1. In an air conditioning system including a compressor, a housing structure for said compressor, a condenser unit within the housing structure and having an air flow exit vent formed therein, a blower directing air from externally of the housing structure into the condenser unit, a cooling unit within the housing structure and having an air flow exit vent formed therein, an expansion apparatus associated with the cooling unit, and a blower directing air from externally of the housing structure into the cooling unit, the improvement comprising a first plate-like heat exchange and support member mounted in the condenser unit, a second plate-like heat exchange and support member mounted in the cooling unit, each of the members being disposed between the respective blowers in the units and the air flow exit vents formed therein such that the flow of air is directed into contact with the members, tube

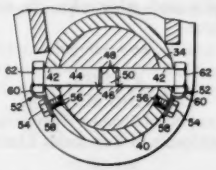


means for containing a refrigerant fluid secured to surface portions of each heat exchange and support member, and a plurality of pins projecting from a surface of each heat exchange and support member and being secured thereto, the pins extending from the surface of the heat exchange and support members into unobstructed contact with the flow of air.

4,102,153
NON-JAMMING SHEAR PIN ASSEMBLY

David Emmert Stover, and Alvin Lewis Menzel, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 21, 1977, Ser. No. 789,363
Int. Cl.² F16D *9/00*
U.S. Cl. 64—28 R **5 Claims**



1. In combination with a drive shaft having a circular cross section and a driven element having a hub provided with a circular opening in which the drive shaft is received, a shear pin assembly for fixing the driven member to the drive shaft, comprising: a first through bore extending through the shaft; a second through bore extending through said hub and axially aligned with said first through bore; and a pair of shear pins positioned in the first and second through bores and having head ends positioned against the hub at opposite ends of the second through bores and having inner ends axially spaced from each other and located in said first through bore; and retaining means extending between the hub and head ends of the shear pins and releasably holding the shear pins in position.

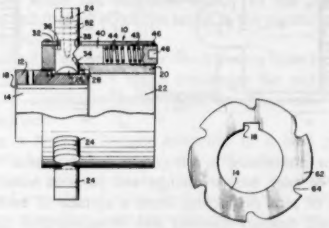
4,102,154
TORQUE DISCONNECT SAFETY COUPLING

Josef Dahlstrand, Jr., 6736 E. 82nd St., Indianapolis, Ind. 46250

Filed Sep. 7, 1976, Ser. No. 709,939
Int. Cl.² F16D *3/56, 7/00*
U.S. Cl. 64—29 **9 Claims**

1. In a torque release coupling; a drive hub, having a cylindrical outer periphery with circumferentially spaced cam lobes

therein, a driven rotary member comprising an annular housing circumferentially spaced about said hub and adapted to be driven thereby, a radial piston slidably disposed in a radial bore in said housing and having an inner end for engagement in said cam lobes for releasably engaging and locking said hub and housing in driving relation, said inner end being shaped to conform to the profile of said cam lobe, said housing having an axial bore intersecting said radial bore with a slidable axial piston disposed therein, said radial piston having notch means therein facing said axial piston, said axial piston having an end to conform to said notch means and adapted to be engaged in said notch means when said hub and housing are engaged in said notch mean when said hub and housing are engaged in driving relation to resist the torque, adjustable biasing means



disposed in said axial bore normally urging said axial piston into engagement with said radial piston when the torque is below a predetermined value, said radial piston extending externally outside of the periphery of said housing and having adjustable and detachable weight means disposed on the externally extending portion to permit readily changing of said weights for varying the centrifugal force causing the inner end of the radial piston into said cam lobe, and means preventing said radial piston from being released from the housing when a predetermined torque overload is exceeded comprising shroud means secured to said housing with a portion thereof extending into a recess disposed in said radial piston; whereby said axial piston and radial piston coact to maintain the hub and housing in engagement with each other when the torque is below a predetermined value.

4,102,155

KNITTING METHOD

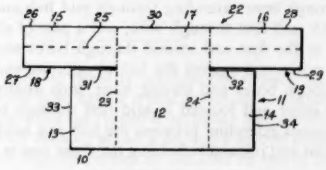
Frank Robinson, and Nigel Stephen Whatmough, both of Breaston, England, assignors to Courtaulds Limited, London, England

Filed Apr. 13, 1977, Ser. No. 787,024

Claims priority, application United Kingdom, Apr. 14, 1976, 15223/76

Int. Cl.² A41B 9/02

U.S. Cl. 66—176 **24 Claims**



1. A method of knitting a blank for a sleeved garment, the method comprising the steps, in either order, of knitting a piece of fabric constituting the body of the garment having front and rear body parts with wales extending in the direction from waist to neck of the garment blank, and knitting another piece of fabric comprising sleeves for the garment with courses extending in the length direction of the sleeves, and also comprising a shoulder region of the garment located between the two sleeves with courses continuous between the sleeves and said shoulder region, said shoulder region being knitted as an extension of the body of the garment with wales continuous between the body and said shoulder region.

4,102,156

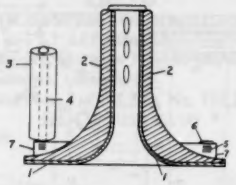
AGITATOR FOR WASHING MACHINES

Wallace D. James, 5946 Barbados Way E., West Palm Beach, Fla. 33407

Filed Jan. 31, 1977, Ser. No. 764,414

Int. Cl.² D06F 13/02

U.S. Cl. 68—4 **4 Claims**



1. An agitator for an agitator type washing machine for selectively washing clothes and washing cylindrical filters, said agitator including:

an elongated shaft portion of substantially circular cross-section, said shaft portion tapering radially outwardly at its bottom portion to form an outwardly extending agitator flange portion;

a plurality of longitudinal, arcuate vanes extending substantially radially outwardly from said shaft portion;

at least one wedge-shaped flange carried by said shaft portion on the upper surface of said agitator and providing a substantially horizontal surface on said agitator;

at least one tapped aperture formed in the upper surface of said wedge-shaped flange; and

at least one threaded, elongated rod removably threadedly engaging said aperture and extending substantially vertically upwardly from said wedge-shaped flange when engaged in said aperture, said rod securing cylindrical filters to said agitator for washing said filters.

4,102,157

APPARATUS FOR REMOVING ORGANIC SOLVENTS FROM TEXTILE MATERIAL

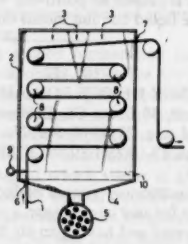
Manfred Schuierer, Michelstadt, Germany, assignor to Brückner Apparatebau GmbH, Erbach, Germany

Filed May 4, 1977, Ser. No. 793,530

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620815

Int. Cl.² D06B 3/12, 9/06

U.S. Cl. 68—5 D **2 Claims**



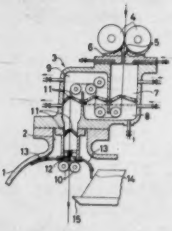
1. Apparatus for removing organic solvents from textile material with steam comprising a treatment chamber having an

upper end and a lower funnel-shaped end, steam inlet means at said upper end, condenser means at said lower end, a web inlet at said lower end, a web outlet at said upper end, and means for guiding a textile web in a generally upward path from said web inlet to said web outlet.

4,102,158
DRAIN DISPOSING DEVICE IN SEAL MECHANISM ON A CLOTH MATERIAL INLET SIDE OF HIGH PRESSURE STEAMER

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co. Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,210
Claims priority, application Japan, Dec. 5, 1975, 50-145619
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E **1 Claim**



1. A seal mechanism for the cloth material inlet side of a high pressure steamer comprising first means forming an enclosed passageway having a first opening for admitting cloth into the passageway from the exterior of said mechanism and a second opening for admitting cloth from the passageway into the high pressure steamer, second means for sealing each of said first and second openings, third means for dividing said passageway between the sealed first and second openings into a plurality of serially arranged pressure reducing chambers, drain receiving trays located within at least one of said pressure reducing chambers and extending transversely of the direction of movement of cloth material through said passageway from the first opening to the second opening, said drain receiving trays subdividing at least the one of said pressure reducing chambers for enhancing the stepwise pressure reducing effect within said pressure reducing chamber, said drain receiving trays arranged to collect drain in said pressure reducing chamber within which they are located and to lead the drain away from the cloth passing through the passageway to the inside surfaces of said pressure reducing chamber, fourth means for collecting the drain within said passageway and for keeping the drain away from the cloth therethrough, and fifth means forming drain guiding passages in communication with said fourth means for discharging the drain collected from said drain receiving trays to one of the interior of the high pressure steamer and the exterior of said seal mechanism located exteriorly of the high pressure steamer.

4,102,159
WASHING MACHINE

Herbert Cruz, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,795
Int. Cl.[2] D06F *13/02, 39/08*
U.S. Cl. 68—132 **2 Claims**

1. A washing machine unit adaptable for installation in an open sink comprising

a motorized unit fitted with suspension means for mounting above a sink,

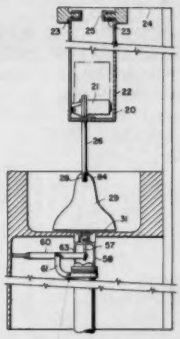
a propeller joined concentrically at an upper section of the propeller by a first shaft to the motorized unit,

a bushing cup mountable in the drain opening of the sink,

said propeller fitted with a second shaft extending concentrically from a lower section of the propeller into the bushing cup,

said bushing cup formed of a body section of a lesser external size in cross-section than the cross-sectional size of the said drain opening, with an external flange extending about the upper periphery of said body section of an external cross-sectional size and shape to close said drain opening when the said flange rests on the upper periphery of said drain opening, with

said bushing cup formed with a blind cylindrical hole extending from the upper surface of the bushing cup along the vertical axis of said bushing cup, said hole of a depth and cross-section to freely slidably fit about the lower



section of said second shaft both with the bushing cup in a first position in which the bushing cup flange rests on the upper periphery of said drain opening and with the bushing cup in a second position in which the bushing cup and said flange is elevated so that the flange is spaced above the upper periphery of the drain opening,

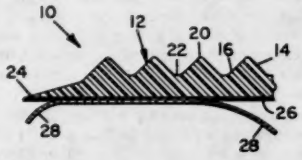
such that the bushing cup serves both as a bearing to the lower section of the second shaft and as a slidable valve seat for closing or opening the drain opening, together with

lever means for moving the bushing cup along the axial direction of the second shaft from said first position to said second position, said lever means serving to hold the bushing cup in place.

4,102,160
PERSONAL CLOTHES WASHBOARD DEVICE

George J. Herbst, 283 Atlantic Isle, North Miami Beach, Fla. 33160

Filed Mar. 28, 1977, Ser. No. 781,557
Int. Cl.[2] D06F *3/02*
U.S. Cl. 68—229 **1 Claim**



1. A readily, permanently attachable washboard surface sheet for a wall of a washbasin, washtub, and the like, comprising a somewhat flexible sheet (10), means for attaching the backwall of said sheet (10) to the basin or tub wall, said sheet having a washboard surface (12) over which clothing items may be rubbed in a cleansing action, said washboard surface comprising a plurality of parallel, spaced apart ridges (14) and furrows (16), said ridges having rounded peaks (20) and said

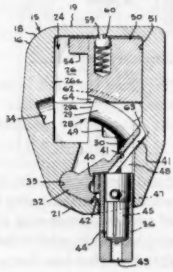
furrows having rounded valleys (22), a basin wall permanently self-attaching high-tack adhesive material on said backwall of said washboard sheet (10), and a readily peelable protective cover sheet (28) on said high-tack adhesive material (26), said washboard sheet (10) being composed of semi-rigid high density plastic material, the ends of said ridges and furrows being sloped (30) to a feathered short side sheet edge (32), said sheet having a feathered long thin edge (24) terminating substantially in the plane of said backwall, said long thin edge being parallel to said ridges and and furrows to attach to the basin or tubwall, whereby the item of clothing being cleansed thereover will slide smoothly over said long thin feathered edge onto said washboard surface and over said ridges and furrows.

4,102,161

ENSHROUDING LOCK DEVICE FOR PAIRED LOCKING BARS AND THE LIKE

Paul R. Proefrock, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Dec. 5, 1977, Ser. No. 857,749
Int. Cl.[2] E05B *67/16*
U.S. Cl. 70—42 **22 Claims**



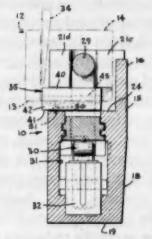
1. A high security hasp-enshrouding lock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in adjacent vertical planes in parallel, laterally alined abutment, the lock comprising a strong penetration and distortion resistant lock casing having a rearwardly opening cavity bounded by spaced bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded over most of their extent by the lock body against access by attacking tools, the lock including a shackle having a bar portion movable generally transversely relative to said vertical planes between a locking position extending transversely through the cavity and the hasp apertures and a retracted position enabling withdrawal of the hasp portion from the cavity, a locking mechanism with the lock body for locking the shackle in said locking position and releasing the same for movement to the retracted position, a wedge-attack-resisting pivoted hasp-clamping member in said cavity disposed laterally adjacent the pair of laterally alined abutting hasp portions and having a wedge-engaging surface projecting rearwardly from the lock casing for resisting destructive attack by wedge-type attack tools driven into the zone immediately rearwardly of the lock casing by persons seeking destructive tearing of the shackle forwardly through the hasp portions, the hasp-clamping member comprising a contact surface portion defining a hasp-receiving passage between the latter and an opposite wall surface of the cavity to receive the laterally alined abutting hasp portions therebetween and having pivot means defining a vertical pivot axis therefor spaced laterally of said passage providing pivotal mounting of the hasp-clamping member for lateral swinging movement in the cavity, said hasp-clamping member normally occupying a first position wherein its rear end portion projects through the rearward opening of said cavity for a predetermined distance beyond the rear of the lock casing and adjacent the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven against the rear of the lock casing, the pivotal mounting of said hasp-clamping member imparting a predetermined component of lateral hasp gripping movement to its contact surface toward the opposite bounding wall surface when the hasp-clamping member is driven forwardly from said first position by the attacking tool and thereby bring the contact surface and the opposite cavity wall surface into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity, said locking mechanism including a clindrical actuating member supported for reciprocative axial movement in said casing along an actuator axis generally perpendicular to the transverse path of the shackle between axially spaced locking and unlocking positions and having a key lock tumbler mechanism for locking and unlocking the actuating member for movement between such positions, and means controlled by said tumbler mechanism and actuating member coactive with control surfaces on said lock casing for restraining said tumbler mechanism and actuating member at their locked positions and releasing them for manually controlled movement of the shackle to said retracted position.

4,102,162

PADLOCK HAVING GUIDED WEDGES FOR RESISTING DESTRUCTIVE WEDGE ATTACK

James Clayton Miller, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Oct. 3, 1977, Ser. No. 839,459
Int. Cl.[2] E05B *67/02*; E05C *19/08*
U.S. Cl. 70—52 **11 Claims**



1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising reactive wedge structure for resisting destructive attack responsive to driving wedge-type attack tools in the zone located between the rear of the padlock and a rearwardly adjacent stationary surface of a portion of the locking bars or adjacent wall surface or the like by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the reactive wedge structure comprising an attack reactive wedge member extending forwardly into the cavity alongside the laterally alined abutting hasp portions between the adjacent lateral surface of the adjacent hasp portion and the confronting

bounding wall surface, said wedge member having a contact surface and a camming surface forming oppositely facing forwardly converging lateral surfaces thereof disposed adjacent and confronting the last mentioned hasp and bounding wall surfaces, respectively, providing a wider rear end portion projecting through said rearward opening for a predetermined distance beyond the rear of the lock body into said zone to be engaged by the attacking tool when driven between the lock body and rearwardly adjacent surface, and said lock body having portions along said confronting bounding surface adjacent the wedge member for imparting a predetermined component of lateral hasp gripping movement to the wedge member toward the opposite bounding wall surface when the wedge member is driven forwardly by the attacking tool and thereby bring portions of the padlock into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,102,163

DEVICE FOR SECURING SKIS AND SKI STICKS

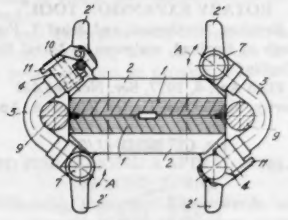
Karl Bösch, Steinbühlweg 57, 4123 Allschwil, Switzerland

Filed Nov. 22, 1976, Ser. No. 743,659

Claims priority, application Switzerland, Mar. 30, 1976, 3943/76

Int. Cl.[2] E05B *73/00*

U.S. Cl. 70—58 **7 Claims**



1. A device for securing skis and ski sticks together comprising:

(i) a pair of holder members for disposing one on the upper face of each of a pair of skis

(ii) a pair of securing arms, each securing arm being mounted by a respective pivot on a respective holder member

(iii) a pair of lock and lock bolt assemblies, each assembly having one of said items on a respective arm and the other of said items on the other of the two holder members,

the arrangement being such that, with the pair of skis disposed bearing-surface to bearing-surface and with a pair of ski sticks disposed one at each side of the skis, the securing arms in locked condition serve to retain the skis and ski sticks secured together.

4,102,164

THEFT PREVENTION APPARATUS FOR A MOTOR VEHICLE

Joseph F. Barbush, Country Club Hills, Ill., assignor to Allen Taradash, Des Plaines, Ill.

Filed Jun. 27, 1977, Ser. No. 810,362

Int. Cl.[2] E05B *65/19*; B60R *25/04*

U.S. Cl. 70—241 **11 Claims**

1. Apparatus for automatically locking the hood of a motor vehicle and disabling the ignition system of the vehicle when the ignition system is switched off, said apparatus comprising:

hood lock means adapted to lock said hood in a closed position;

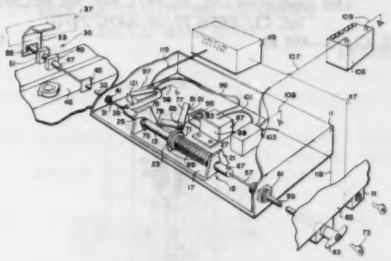
means including a slide member adapted to move reciprocally in a longitudinal direction,

said slide member having a transverse radial groove;

means coupling said slide member to said hood lock means for translating the positioning of said slide member to said hood lock means to lock said hood lock means when said slide member is in an enabling position and to unlock said hood lock means when said slide member is removed from said enabling position;

means for biasing said slide member toward said enabling position;

means including a latching member for engaging said groove of said slide member to hold said slide member removed from said enabling position;



means coupled to the ignition system for withdrawing said latching member from engagement with said groove to release said slide member to slide to said enabling position responsive to the ignition system being switched off; and,

means including a switch positioned to engage said slide member when said slide member is at said enabling position for disabling the ignition system when said slide member engages said switch.

4,102,165

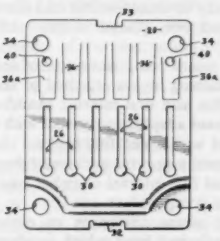
KEY HOLDER

Walter Henry Dziura, Nautatuck, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 1, 1977, Ser. No. 820,781

Int. Cl.[2] A47G *29/10*

U.S. Cl. 70—456 B **1 Claim**



1. A key holder of the character described comprising a body of sheet material having front, top and back portions constructed with an internal region to contain heads of a plurality of key loops, said body having a plurality of parallel slots in the top portion along said region each narrower than the diameters of the heads of said key loops, said slots each extending to an enlarged opening in the front portion for passage of said heads therethrough, the enlarged openings being arranged in a linear path adjacent the juncture of said top and front portions, a series of fingers stamped from the back of the holder and extending toward the top and having their distal ends disposed in the internal region, the ends respectively overlaying said openings for holding inserted key loops in the holder and impeding their passage through said openings, the holder being formed with a pair of apertures therethrough adjacent the bottom thereof respectively at opposite corners

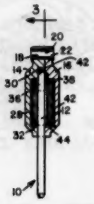
thereof, the fingers adjacent the openings being foreshortened to allow space for the openings and the said adjacent fingers being perforated to make them flex more readily so that each finger flexes under approximately the same force as each other finger.

4,102,166

KEY BOW COVER

Donald R. Hughes, 2600 Brower Ave., Simi Valley, Calif. 93065

Continuation of Ser. No. 718,014, Aug. 26, 1976, abandoned.
This application Oct. 25, 1977, Ser. No. 845,397
Int. Cl.[2] E05B *19/04*; A47G *29/10*
U.S. Cl. 70—456 R **5 Claims**



1. A key bow cover comprising:

a first plate having a first internal chamber;

a second plate having a second internal chamber, said second plate being hingedly connected to said first plate so that said second plate may be moved relative to said first plate permitting access into said first and said second interior chambers;

fastener means interconnecting said first and said second plates, said fastening means when operable maintaining said first and said second plates in an abutting relationship with said first and said second interior chambers cooperating together to form a single closed chamber, with said fastening means being disconnected said second plate being capable of being hingedly moved relative to said first plate;

said first interior chamber being substantially twice the size of said second interior chamber, whereby the bow of a key and a coin may be placed within said first interior chamber and a second coin placed within said second interior chamber;

said fastening means comprises a pair of spaced apart snaps;

a key bow retaining means attached to said first plate and located within said first internal chamber, said key bow retaining means adapted to connect with the bow of a key when placed within said first internal chamber and functions to normally prevent accidental disassociation of the key from said first internal chamber when said first internal chamber is exposed;

said retaining means comprises an elongated projection having an enlarged head which is adapted to be placed through an appropriate opening formed within the bow of a key; and

an insert located about the key bow and within said first interior chamber.

4,102,167

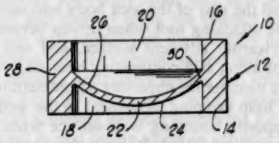
METHOD OF MANUFACTURING INTEGRAL FLUID PRESSURE RUPTURABLE APPARATUS

Loren E. Wood, and Edward H. Short, III, both of Tulsa, Okla., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 649,743, Jan. 16, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,825
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—54 **9 Claims**

1. A method of manufacturing an integral reverse buckling fluid pressure rupturable apparatus comprising:

forming a recess in a support body having opposite ends, said recess extending from one of said opposite ends of said body towards the other and terminating in close proximity to said other end whereby a relatively thin integral fluid pressure rupturable portion remains in said body; and



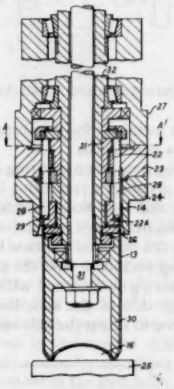
applying pressure on a side of said rupturable portion of said body so that said rupturable portion is formed into a concave-convex shape.

4,102,168

ROTARY EXPANSION TOOL

Frederick D. Brookes, Northwood, and Jozef T. Franek, Chorleywood, both of England, assignors to Metal Box Limited, Reading, England

Filed Apr. 4, 1977, Ser. No. 784,461
Claims priority, application United Kingdom, Apr. 22, 1976, 16254/76
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—117 **14 Claims**

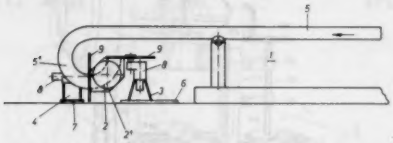


1. A rotary expansion tool for radically expanding the mouth of a hollow article, said tool comprising a cage, a plurality of rollers held by the cage in circumferentially spaced relation for movement in an orbit about a longitudinal axis, and separately formed inner race and outer race, coaxial with said orbit, said inner race holding the rollers between said inner race and said outer race, each roller having a work portion projecting longitudinally beyond said outer race, drive means operatively connected to said rollers for precessing said rollers within said outer race in said orbit around said axis to effect rotation of said work portions prior to engagement thereof with an article, and support means for holding an article coaxially with said orbit with said rotating work portions progressively engaging the mouth of the article so as to expand the mouth outwardly and axially to a predetermined dimension.

4,102,169
METHOD AND APPARATUS FOR PIPE BENDING

Rolf Koser, Osterheide, Fed. Rep. of Germany, assignor to Sidro GmbH & Co. Ludwig Moller, Bunde, Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 740,955
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605795
Int. Cl.[2] B21D *9/00*
U.S. Cl. 72—128 5 Claims

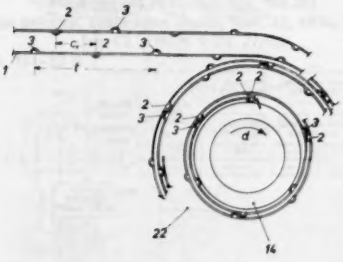


1. A method for the production, from a run of linear pipe of indefinite length, of pipe bends which are cut to a required length and hot-calibrated and do not require any further treatment, said method comprising the steps of:
(i) heating an end portion of said linear pipe run to a temperature suitable for forming a bend in said end portion;
(ii) while said end portion is at said temperature, forming a bend therein; then
(iii) while said bent end portion is still at said temperature, calibrating or sizing said end portion to finished dimensions; and,
(iv) while said calibrated bent end portion is still at said temperature, severing said end portion at two axially spaced points thereon to provide a calibrated cut pipe bend.

4,102,170
METHOD FOR MAKING A SPIRAL COIL HAVING SPACED TURNS

Hermann Wilkening, Dusseldorf-Kaiserswerth, and Hans-Joachim Loges, Dusseldorf, both of Germany, assignors to IOG Industrie-Ofenbau GmbH, Dusseldorf, Germany

Filed Jun. 3, 1976, Ser. No. 692,430
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524763
Int. Cl.[2] B21C *47/04*
U.S. Cl. 72—147 19 Claims

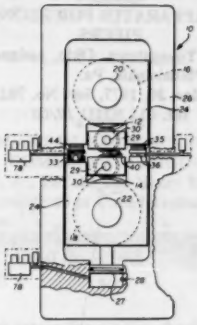


1. Method for making a spiral coil comprising the steps of;
(a) moving a band horizontally toward a horizontal winding mandrel for winding a coil,
(b) continuously forming in advance of said mandrel a succession of regularly spaced deformations in the band edges, said deformations alternately protruding from the opposite band surfaces and determining the spacing of adjacent turns of the coil, and
(c) progressively shifting said succession of deformations along the band for each successive turn of the coil by a predetermined dimension such that all oppositely protruding deformations between adjacent turns come into tangential interlocking engagement with each other, such predetermined dimension of shift taking into account the increase in turn length due to band thickness and coil spacing and the spacing between deformations.

4,102,171
LOAD TRANSFER BLOCK FOR ROLLING MILLS

Henry Alfred Petry, Sparta, and William I. deVersterre, Warren, both of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Jun. 13, 1977, Ser. No. 806,068
Int. Cl.[2] B21B *31/00*
U.S. Cl. 72—245 13 Claims

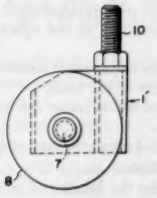


1. Apparatus comprising a load transfer block for a prestressed rolling mill including a hydraulic motor having a cylinder, a piston in the cylinder, the cylinder and piston having relative movement with respect to one another, a chamber into which the hydraulic fluid in the cylinder can flow in the event of excessive loading on the hydraulic motor, an obstruction for preventing access of the hydraulic fluid to the chamber during normal operation of the hydraulic motor, a surface exposed to gas pressure for holding the obstruction in position to prevent escape of hydraulic fluid from the motor cylinder during normal loading of the hydraulic motor, the gas pressure being correlated with the intended maximum load on the motor for displacement of the obstruction when the motor is subjected to substantial overload.

4,102,172
CASTER FRAME

Shuichiro Iiyoshi, Tokyo, Japan, assignor to Yugen Kaisha Iiyoshi Seisakusho, Japan

Division of Ser. No. 629,783, Nov. 6, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,131
Int. Cl.[2] B21K *1/26*
U.S. Cl. 72—254 4 Claims



1. A method of producing caster supporting frames having a first end portion with a hollow space therethrough for receiving therein an upright connector rod, and a second end portion

for supporting a horizontal axle of a caster wheel or wheels, said method comprising the steps of:

shaping a bar-like rod or uniform cross-sectional configuration to have along one side thereof a first through hole extending longitudinally therethrough and along the other side thereof a second through hole extending longitudinally therethrough parallel to said first through hole; and

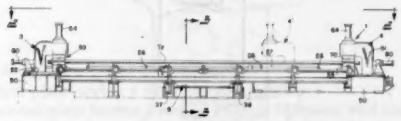
cutting said bar-like rod transverse to the longitudinal length thereof into a number of pieces of a predetermined length to obtain the caster supporting frames, whereby said first through hole forms said hollow space of said first end portion and said second end portion is also hollow therethrough.

4,102,173

END FORMING APPARATUS FOR ELONGATED WORK PIECES

Joseph T. Saloom, Youngstown, Ohio, assignor to Wheatland Tube Company, Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 782,766
Int. Cl.[2] B21D *19/08*
U.S. Cl. 72—306 **12 Claims**



1. An apparatus for forming work pieces comprising a first generally C-shape head defining a feed opening therein, a first clamp member fixedly mounted on said head and extending into the feed opening, a second movable clamp member mounted on said head and extending into said opening generally in alignment with but in an opposite direction from said first clamp member, said second movable clamp member selectively reciprocating between open and closed positions, means automatically to convey a work piece to the feed opening of said first head for support by said first clamp member when said second movable clamp member is in open position while simultaneously removing a work piece from said first clamp member, and forming means reciprocally movable into and out of said feed opening generally perpendicularly to the first and second clamp members, said forming member moving into said feed opening and engaging and forming the work piece when the second clamp member is in the closed position engaging the work piece, thereby to cooperate with said first clamp member tightly to grip and hold the work piece in position during forming.

4,102,174

MULTI-TRACK MACHINE PRESS

Robert Blase, 1009 Round Hill Rd., Fairfield, Conn. 06430

Filed Jul. 9, 1976, Ser. No. 703,801
Int. Cl.[2] B21D *43/02*
U.S. Cl. 72—421 **9 Claims**

1. A multi-track machine press comprising:

A. a base with at least two upstanding members;

B. a ram movably mounted to the upstanding members of the base;

C. a first motor driven upper shaft rotatably mounted in the upstanding members of the base;

D. connecting means for driving the ram from said first upper shaft;

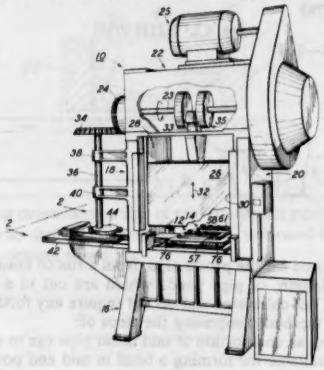
E. a second shaft driven by said first upper shaft in a two-to-one gear reduction;

F. a cam mounted near the lower end of said shaft, said cam having constant radii portions;

G. a drive bar having upstanding cam followers interacting with said cam, wherein rotation of said cam imparts linear movement to the drive bar;

H. at least two apertured pillow blocks interconnected to the base through which said drive bar passes for maintaining orientation of said drive bar;

I. at least two slides mounted for sliding movement on the base, said sliding movement perpendicular to the movement of the ram; and



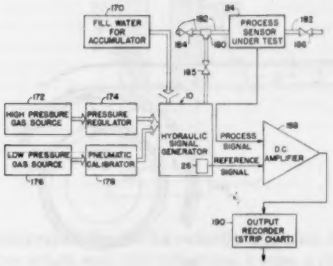
J. lateral positioning means interconnected with said slides for positioning said slides with respect to each other and for interconnecting said slides to the drive bar; whereby rotation of the upper shaft causes the ram to repetitively move between its uppermost and downwardmost positions while said slides repetitively move between their left-handmost and right-handmost positions.

4,102,175

RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR

Carlton G. Foster, Mountain View, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 15, 1976, Ser. No. 732,560
Int. Cl.[2] G01L *27/00*
U.S. Cl. 73—4 R **18 Claims**



1. A hydraulic signal generator for use in in situ verification of the response time of a hydraulic process sensor comprising a first reservoir for containing a gas under pressure; a second reservoir for containing a gas and a liquid under pressure; conduit means connecting said first and second reservoirs for communicating gas between said first and second reservoirs; means in said conduit means intermediate of said reservoirs for gating said conduit means; throttle means in said conduit means intermediate of said reservoirs for providing substantially linear pneumatic pressure equalization in the pressure ranges of interest between said reservoirs; and non expansible outlet means coupled to said second reservoir for providing hydrau-

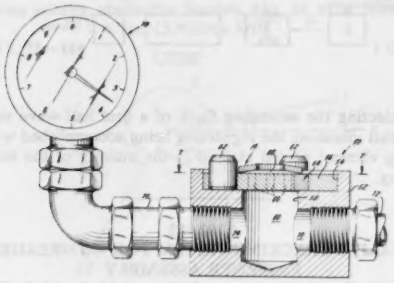
lic fluid communication between said second reservoir and said process sensor.

4,102,176

METHOD AND APPARATUS FOR MEASURING INTENSITY OF PEENING OF SMALL SURFACES

Henry O. Fuchs, Stanford, Calif., assignor to Metal Improvement Company, Inc., Teaneck, N.J.

Filed Apr. 29, 1977, Ser. No. 792,189
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—12 27 Claims



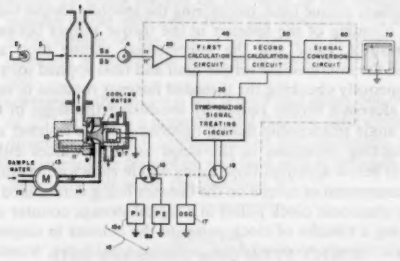
6. A peening intensity test member comprising:
(a) a base structure having at least one flat surface;
(b) test element of relatively thin configuration and having opposite flat surfaces of substantially the same size as the flat surface of said base structure;
(c) said test element being disposed with one flat surface thereof in abutment against said flat surface of the base member; and
(d) securing means for removably connecting said test element to said base structure so that substantially all of the surface of the test element opposite from said one surface thereof is exposed for peening.

4,102,177

DENSITOMETER

Mitsuyoshi Okada, Yokohama; Tetsuya Okuno, Chofu; Takehiko Sato, Yokohama, and Masao Shima, Tokyo, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,281
Claims priority, application Japan, Nov. 12, 1976, 51-136726
Int. Cl.[2] G01N *9/24, 21/06*
U.S. Cl. 73—32 R 13 Claims



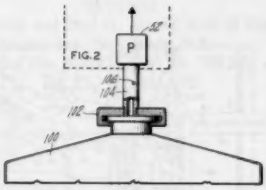
1. A densitometer for measuring a concentration of a liquid in a system including liquids and suspended solids insoluble in each other, comprising in combination:
means for producing two emulsified conditions of the system, a first condition containing an emulsified liquid of relatively large particle diameter and a second condition containing an emulsified liquid of a relatively small particle diameter;
means for illumination;
means for receiving light from said illuminating means and producing an electrical signal proportional to the quantity of light received;
means for containing said system, said containing means disposed between said illuminating means and said light receiving means;
said light receiving means generating a first signal in response to the light passing through said system in said first condition and a second signal in response to the light passing through said system in said second condition; and
means responsive to said first signal and said second signal for generating a signal proportional to the concentration of said emulsified liquid.

4,102,178

GAS IN COOLANT DIAGNOSTICS FOR INTERNAL COMBUSTION ENGINE

Henry J. Mercik, Jr., Enfield, and Henry E. Goetsch, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,094
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—49.7 5 Claims



3. In a method of measuring gas in the coolant of an engine cooling system, the steps of:
operating the engine;
determining that the thermostat of the engine is open;
allowing gas to escape from the cooling system through a small orifice of a known size; and
measuring the pressure across the orifice.

4,102,179

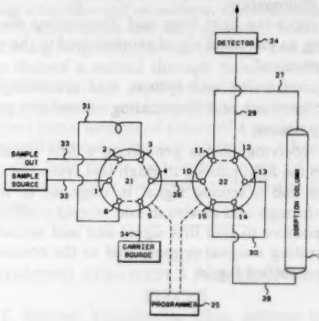
LIQUID COLUMN CHROMATOGRAPHIC SEPARATION

James B. Snell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1977, Ser. No. 783,514
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—61.1 C 17 Claims

1. A process for sequentially subjecting a plurality of liquid samples to chromatographic separation and analysis comprising sequentially passing each liquid sample through at least a portion of a column packed with particulate sorbent to effect for each said liquid sample elution of at least a portion of the components of each said liquid sample from the column in response to the relative affinity of said components for the sorbent, and analyzing at least a portion of the components of each said liquid sample as said portion of the components is eluted from said column, wherein periodically the point of introduction of liquid sample into the column is reversed in

such a fashion that differences observed in the analysis of the various liquid samples can be attributed to differences in the



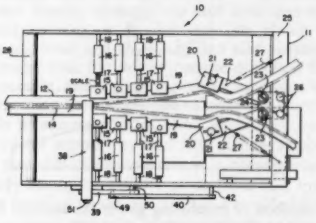
liquid samples rather than differences due to compacting of the particulate sorbent in the column.

4,102,180

SLIDE FASTENER ENDURANCE TESTER

Vasant K. Devarakonda, Holliston, and John L. Kovar, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 30, 1977, Ser. No. 811,933
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—91 **9 Claims**



1. In a slide fastener endurance tester comprising means for supporting a slide fastener extended longitudinally and transversely and means for reciprocatingly moving the slider of said slide fastener back and forth along a predetermined portion of the chain of said slide fastener to open and close said slide fastener, the improvement which comprises means for variably and controllably loading said slide fastener transversely thereof and means for variably and controllably loading said slide fastener longitudinally thereof while said slider is being reciprocatingly moved along said chain, and means for counting the number of cycles of said reciprocating movements of said slider along said chain.

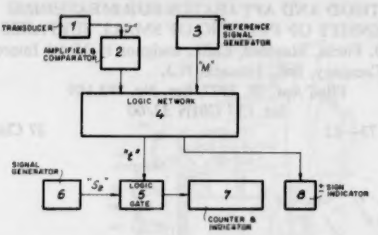
4,102,181

PROCEDURE FOR DETERMINING THE STARTING POINT OF FUEL INJECTION ESPECIALLY FOR RUNNING INTERNAL-COMBUSTION ENGINES

Gyula Cser, Budapest; Géza Mizser, Cegléd; Péter Rausnitz, and Zoltán Székely, both of Budapest, all of Hungary, assignors to Autóipari Kutató Intézet, Budapest, Hungary

Filed Dec. 21, 1976, Ser. No. 753,008
Claims priority, application Hungary, Dec. 23, 1975, AU 352
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A **5 Claims**

1. A process for determining the starting point of fuel injection in internal-combustion engines having a fuel-injection nozzle with a housing and a needle valve and a displacement limited by a stroke limiter, comprising the steps of: observing and consecutively registering vibrations and other noise phenomena arising from abutments of the needle in the valve against the stroke limiter, or full opening of the needle valve;



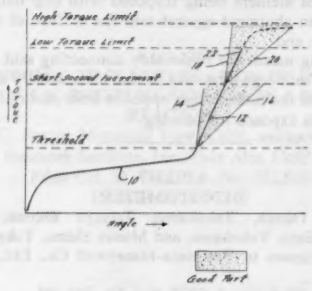
and selecting the ascending flank of a first half-wave signal from that vibration; the registering being accomplished with a sensing element placed at least in the vicinity of the nozzle housing.

4,102,182

QUALITY CHECKING SYSTEM FOR A THREADED FASTENER ASSEMBLY

Lowell R. Brown, Farmington Hills, and Nathaniel L. Field, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 5, 1976, Ser. No. 683,370
Int. Cl.[2] G01L *3/02*
U.S. Cl. 73—136 R **3 Claims**



1. A method for quality checking threaded fastener assemblies comprising the steps of establishing a minimum torque threshold level, high and low final applied torque limits and an intermediate torque limit, monitoring the absolute torque value during torquing of the fastener in the torque ranges between the threshold value and the intermediate torque limit and between the intermediate torque limit and final applied torque, simultaneously checking the threaded fastener rotation in each of the aforesaid torque ranges by measuring the slope of the torque angle relationship during tightening of the fastener and for detecting variations in the slope angle to values either above or below specified slope limits within each torque range, the measurement of torque on the fastener being determined by storing electronic clock pulses in a digital storage counter and triggering a transfer of clock pulses to the counter in response to torque signals received from a torque transducer, transferring the torque signal counter value to a logic circuit, transferring fastener angle pulses from a pulse transducer to the logic circuit whereby the logic circuit responds by distributing electronic clock pulses to an angle storage counter, dividing the stored value for the torque pulses by the stored value of the angle pulses to establish a slope relationship between torque applied to the fastener and the angle of fastener rotation for a

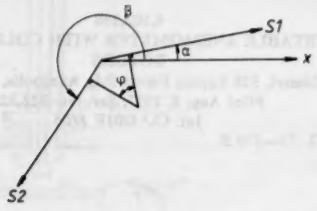
corresponding torque and detecting the variations in the magnitude of that quotient from preselected values above and below established limits whereby both slope value of the torque angle relationship and the torque value itself may be detected.

4,102,183

METHOD OF MINIMIZING ERRORS IN MEASURING OF TENSION IN MOVING STRIP

Rune Thenander, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Aug. 12, 1977, Ser. No. 824,172
Claims priority, application Sweden, Aug. 16, 1976, 76091081
Int. Cl.[2] G01L 5/04
U.S. Cl. 73—144 **1 Claim**



1. A method for determining the tension in a moving strip by measuring the force along a direction on load cells at the ends of a measuring roll over the periphery of which the strip is partially wrapped and wherein the errors in measuring the tension when the strip is accelerating or decelerating in speed are minimized, the steps including

(1) measuring an angle α between an initial generally horizontal measuring direction X passing through the load cells and the predetermined direction of passage of the strip away from the periphery of the measuring roll:

(2) measuring an angle β between the initial generally horizontal measuring direction X passing through the load cells and the direction opposite to the predetermined direction of passage of the strip towards the periphery of the measuring roll:

(3) calculating the force F_{acc} needed to accelerate the measuring roll;

(4) calculating both $\Delta S1$ and $\Delta S2$ from the following formulas

$$\Delta S1 = F_{acc} \cdot (\cos \beta / \cos \alpha + \cos \beta)$$

and

$$\Delta S2 = - F_{acc} (\cos \alpha / \cos \alpha + \cos \beta)$$

wherein S1 is the tension on the strip in the direction of passage of the strip away from the measuring roll and S2 is the tension on the strip in the direction opposite to the direction of movement of the strip towards the measuring roll,

(5) determing the angles α and β such that either one or both of $\Delta S1$ or $\Delta S2$ is a minimum and thereby determining the direction X^1 which corresponds to such minimum, and

(6) measuring the tension on said load cells at the ends of the measuring roll along the direction X^1.

4,102,184

TIRE PRESSURE AND MATE CHECK

Billy J. Castleberry, P.O. Box 647, Lubbock, Tex. 79408

Filed Oct. 21, 1976, Ser. No. 734,550
Int. Cl.[2] B60C 23/06
U.S. Cl. 73—146.2 **28 Claims**

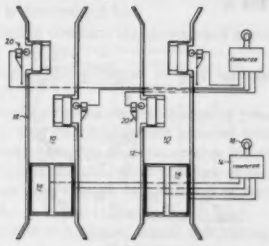
1. A device for in situ determining the inflation pressure in a pneumatic tire having sidewalls comprising:

a. a driveway for a vehicle having said tire,

b. guide rails projecting upward from the driveway to guide the vehicle therealong,

c. a cradle along the driveway in the path of said tire on the vehicle,

d. a probe on a bracket,



e. push means operatively associated with said probe for pushing the probe horizontally into the sidewall of a tire to be tested,

f. measuring means operatively associated with said probe for measuring the results of the pushing indicative of inflation pressure of the tire, and

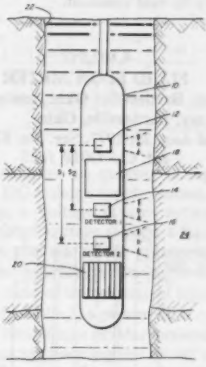
g. said probe connected to said cradle.

4,102,185

ACOUSTIC-NUCLEAR PERMEABILITY LOGGING SYSTEM

Donald J. Dowling, and Dan M. Arnold, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,978
Int. Cl.[2] E21B 47/10
U.S. Cl. 73—155 **35 Claims**



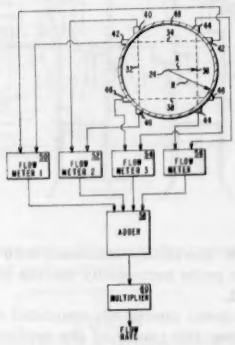
13. A method of evaluating the permeability of an underground formation adjacent a borehole therethrough comprising the steps of irradiating underground material, including particles of fluid in the vicinity of said formation, with neutrons of 10 MEV or more energy, generating one or more acoustic pulses in said fluid in said borehole in the vicinity of said formation, determining the net flow of fluid across the boundary between said borehole and said formation due to the interaction of said pulses with said boundary, by measuring the net flow of said fluid in said borehole through the mechanism of detecting the radiation emitted by particles produced as a result of said neutron irradiation and which are part of said fluid flowing in said borehole, and determining a measure of said permeability of said formation based on said net fluid flow across and boundary.

4,102,186

METHOD AND SYSTEM FOR MEASURING FLOW RATE

Alvin E. Brown, Claremont, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1976, Ser. No. 708,284
Int. Cl.² G01F 1/66
U.S. Cl. 73—194 A **13 Claims**



8. A method for determining the volumetric flow rate of a fluid flowing as turbulent or plug flow in a cylindrical conduit having a radius R and a flow axis comprising the steps of:

determining the average flow velocities of said fluid in each of more than two equal length chordal measuring paths of length greater than $2\sqrt{R^2-X^2}$ and lying at a radial distance X of between about 0.5R and 0.6R,

multiplying each said average flow velocity by a constant related to said radial distance X and the path length thereby to provide volumetric flow rate, and

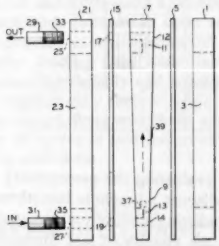
obtaining the average of the products of each said average flow velocity by said constant.

4,102,187

FLUID FLOW METER

Keith A. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1977, Ser. No. 827,762
Int. Cl.² G01F 1/22
U.S. Cl. 73—209 **8 Claims**



1. A fluid flow meter comprising a fluid-tight, sandwiched assembly of a first flat faced plate; a first sheet of transparent, fluid impervious material; a second flat faced plate; a second sheet of transparent, fluid impervious material; and a third flat faced plate; all co-extensive in face size;

(a) each of said plates having at least one elongated slot cut therethrough, said slots of the same length and width and said plates assembled with slots in coplanar alignment;

(b) said second plate symmetrically tapered to be wider at the upper end than the lower end; and having extensions of said slot cut less than all the way through said second plate with a perforation extending through the second plate into said extension at each end of the second plate;

(c) the sheet assembled adjacent to a perforation in the second plate having a perforation therein aligned with the perforation of said second plate;

(d) the plate assembled adjacent a perforated sheet having a perforation therein aligned with the perforation in said sheet thereby forming passage for fluid from outside the meter to the slot in said second plate; and

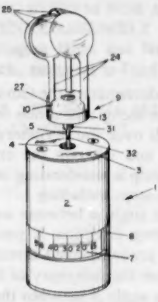
(e) a plummet inserted in the slot in the second plate.

4,102,188

PORTABLE ANEMOMETER WITH COLLAPSIBLE ROTORS

R. A. Simerl, 528 Epping Forest Rd., Annapolis, Md. 21401

Filed Aug. 5, 1977, Ser. No. 822,325
Int. Cl.² G01F 1/06
U.S. Cl. 73—170 R **7 Claims**



1. An anemometer comprising a tubular casing, a spindle journalled in said casing and projecting upwardly therefrom for rotation relative thereto, spaced radial arms pivotally arranged relative to the projected end of said spindle, cupped means on the outer ends of said arms whereby said arms are wind drivingly rotated, and link means pivoted to said spindle and the inner ends of and for moving said arms from active horizontal to inactive collapsed positions relative to said spindle.

4,102,189

TURBINE FLOWMETER WITH OVERSPEED PROTECTION

Gary D. Cohrs, Tempe, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Filed Jun. 20, 1977, Ser. No. 807,989
Int. Cl.² G01F 1/115, 1/12
U.S. Cl. 73—230 **8 Claims**

1. A turbine flowmeter comprising:

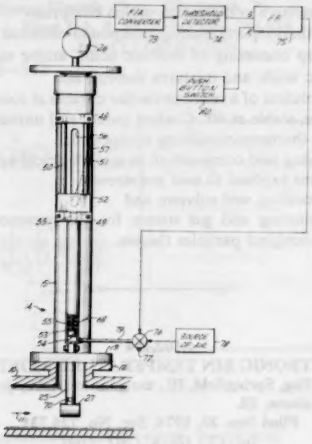
a turbine wheel;

means for supporting the turbine wheel for rotation;

a sleeve through which the supporting means passes for inserting the turbine wheel in a line to intercept fluid flowing therethrough and to rotate responsive to the intercepted fluid;

means for controlling the rotational position of the support-

ing means as it passes through the sleeve to align the turbine wheel with the direction of flow through the line; means for sensing the rotation of the turbine wheel; and



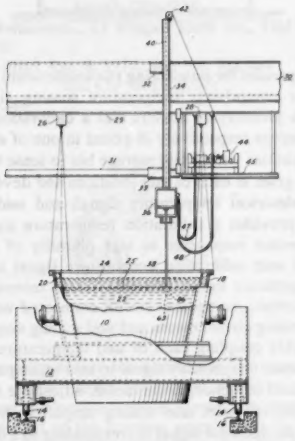
means responsive to the sensing means for rotating the sleeve and the supporting means as a unit to reduce the fluid intercepted by the turbine wheel.

4,102,190

METHOD AND APPARATUS FOR DETERMINING THE WEIGHT OF SLAG ON A BATH OF MOLTEN METAL

Ronald J. Fradeneck, and Edmund J. Biancarelli, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 7, 1977, Ser. No. 785,727
Int. Cl.[2] G01G 9/00; G01F 23/14
U.S. Cl. 73—302 **3 Claims**



1. A method of determining the weight of the molten slag covering a bath of molten metal, comprising:

(a) determining the surface area of the slag and the pressure head at the slag-metal interface,

(b) multiplying said surface area by said pressure head,

(c) said pressure head is determined by:

(i) inserting a consumable tubular member downwardly into said vessel until said member passes below the interface between said molten slag and said molten metal while passing a gas at a constant flow rate through said member, and

(ii) measuring the pressure head at the bottom of said tubular member at about the instant said bottom is at said interface, and

(d) the instant the bottom of said tubular member is at said interface is determined by:

(i) maintaining constant the downward movement of said tubular member,

(ii) measuring the pressure at said bottom at constant intervals,

(iii) subtracting the maximum change in pressure that can occur in said slag during said interval from the change in pressure between each successive interval,

(iv) subtracting the change in pressure at each (n-1) interval from the change in pressure at each successive interval,

(v) in response to a control signal, calculating the pressure head at the bottom of said member, and

(vi) producing a control signal when one of the following two conditions exists:

(a) the results of the subtractions of both (iii) and (iv) are positive; and

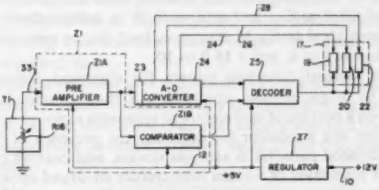
(b) a predetermined time interval has elapsed since the pressure head at said bottom exceeded a predetermined value.

4,102,191

DIGITAL FUEL GAUGE

Roger J. Harris, 5424 Gregg St., Dallas, Tex. 75235

Filed Nov. 19, 1976, Ser. No. 743,458
Int. Cl.[2] G01F 23/06, 23/10
U.S. Cl. 73—313 **4 Claims**



1. Apparatus to measure the quantity of liquid in a storage tank comprising: a DC voltage supply; means to regulate said DC voltage supply; a voltage divider network means connected to said regulated voltage supply; a liquid level sensing means connected to one side of the voltage divider network, said voltage divider network producing a first DC voltage proportional to the ratio of the volume of liquid in the tank to the inside volume of said tank; a preamplifier means connected to the other side of the voltage divider network for producing a second DC voltage representing the actual volume of liquid in said tank; an A-D converter means, the output of said preamplifier means being connected to an A-D converter means to convert said second DC voltage to a binary coded decimal digit code said binary coded decimal code being comprised of several groups of binary bits, each group representing a different decimal digit, said converter means sequentially generating each group of binary bits; decoder means connected to said output of said A-D converter means to receive said sequentially generated binary decimal digit code, said decoder means producing decimal digit codes; display means comprised of a plurality of display units each dedicated to a different decimal digit connected to said decoder means to receive said decimal digit code; enabler means connected between A-D converter means and the display means to selectively enable each display unit so that each display unit receives only the decimal digit code to which it has been dedicated; voltage comparator means adapted to receive a voltage output of the preamplifier means to compare same with a predetermined voltage level

such that when the output of the preamplifier means falls below a predetermined voltage level, the voltage comparator means initiates a warning signal; NAND gates connected between the voltage comparator means and decoder means; oscillator means connected to said NAND gates such that when the voltage comparator enables the NAND gates, the output of the decoder means is periodically interrupted; and a decade counter, the input of said decade counter being connected to the output of the oscillator means, the output of the decade counter being connected to the A-D converter means to control the cycle of the output of the A-D converter means.

4,102,192

METALLIC CARBOXYLATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

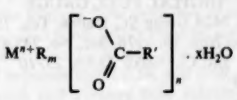
James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1976, Ser. No. 676,435

Int. Cl.[2] **C09K** *3/00;* **G01K** *3/00, 11/00;* **C08K** *5/09;* **C08L** *63/00*

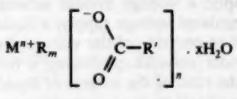
U.S. Cl. 73—339 R **35 Claims**

1. A composition curable at room temperature consisting essentially of about 20 to about 250 phr of at least one metallic carboxylate and a solution of an air-dryable epoxy resinous carrier stable at 60° C when cured, and unreactive with said metallic carboxylate, said metallic carboxylate having the general formula



where each R is independently selected from the group consisting of alkyl to C_{20}, and aryl, each R′ is independently selected from alkyl to C_6, M is copper, lead, tin, or mercury, m is 0 to 4, n is 1 to 4, and x **15** 0 to 10.

16. A thermal detection system for electrical apparatus cooled by a gas stream, comprising a thermoparticulating coating on a portion of said electrical apparatus exposed to said gas stream and a monitor for detecting the presence of thermoparticulated particles in said gas stream, said coating comprising a solid layer of a room temperature air-dryed epoxy or polyester resinous carrier containing about 20 to about 250 phr of a metallic carboxylate having the general formula



where each R is independently selected from the group consisting of hydrogen, alkyl to C_{20}, cycloalkyl to C_{20}, alkylaryl to C_{20}, arylalkyl to C_{20}, aryl, and heterocyclic, each R′ is independently selected from alkyl to C_6, M is copper, lead, tin, or mercury, m is 0 to 4, n is 1 to 4, and x is 0 to 10.

4,102,193

METHOD FOR PROTECTING ELECTRICAL APPARATUS AND THERMAL DETECTION SYSTEM USING SULFONIC ACID THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 645,164, Dec. 30, 1975, Pat. No. 4,046,733. This application May 19, 1977, Ser. No. 798,542

Int. Cl.[2] **G01K** *1/02, 3/00, 11/00, 13/00*

U.S. Cl. 73—339 R **16 Claims**

1. A method of protecting electrical apparatus from damage due to overheating and for thereafter determining the location of said overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected comprising:

(A) preparing a composition which comprises

(1) a thermoparticulating compound selected from the group consisting of sulfonic acids, amine salts of sulfonic acids, and mixtures thereof; and

(2) a solution of a resinous carrier curable at room temperature, stable at 60° C when cured, and unreactive with said thermoparticulating compound;

(B) applying said composition to said electrical apparatus at positions exposed to said gas stream;

(C) evaporating said solvent; and

(D) monitoring said gas stream for the presence of thermoparticulated particles therein.

4,102,194

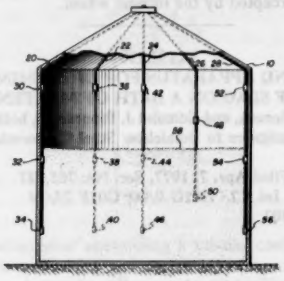
ELECTRONIC BIN TEMPERATURE MONITOR

William T. Eng, Springfield, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Sep. 20, 1976, Ser. No. 724,731

Int. Cl.[2] **G01K** *1/02, 3/00*

U.S. Cl. 73—340 **6 Claims**

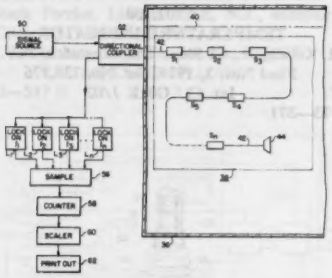


1. An apparatus for monitoring the temperature of grain in a storage bin comprising: temperature sensing circuit means including a plurality of sensors and a calibration resistance, each said sensor respectively disposed in one of a plurality of discrete locations within said storage bin to sense the temperature of the grain at each of said locations and develop a corresponding electrical temperature signal, and said calibration resistance provides a calibration temperature signal; scaling amplifier means responsive to said plurality of temperature signals and said calibration temperature signal to provide a scaled temperature signal, scanning circuit means including a digital electronic multiplexer circuit connected with said temperature sensing circuit means and said scaling amplifier means for effectively coupling each of said temperature signals and said calibration temperature signal to said scaling amplifier in a predetermined sequence, alarm means, adjustable alarm circuit means connected with said scaling amplifier means and for producing an electrical signal corresponding to a desired maximum temperature, means for receiving and comparing said scaled temperature signal and said desired maximum temperature signal and producing an alarm signal for actuating said alarm means whenever the temperature of the grain at the associated location meets or exceeds said desired maximum temperature, digital electronic readout circuit means connected to said scaling amplifier means and responsive to said scaled temperature signal for sequentially providing a digital display of said grain temperature at each said discrete location.

4,102,195
HOT SPOT TEMPERATURE SENSOR

John H. Thompson, Severna Park; Stephen Kowalyshyn, Columbia, and Arthur Nelkin, Annapolis, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 8, 1977, Ser. No. 766,819
Int. Cl.[2] G01K 11/26
U.S. Cl. 73—340 23 Claims

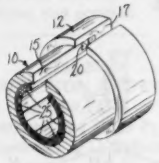


1. A temperature sensing system, comprising:
(A) an acoustic waveguide;
(B) transmitting means coupled to said acoustic waveguide for transmitting a continuous wave acoustic signal down said acoustic waveguide;
(C) a mechanical resonator having a resonant frequency which varies with temperature;
(D) a compliant coupling member for coupling said acoustic signal in said acoustic waveguide to said resonator which will then reflect back up said acoustic waveguide any acoustic signal of a frequency equal to the then resonant frequency of said resonator; and
(E) means for detecting and processing the reflected back signal.

4,102,196
HEAT SENSOR

Ludwig K. Holtermann, 43 Ragged Rock Rd., Old Saybrook, Conn. 06475

Filed Apr. 8, 1977, Ser. No. 786,004
Int. Cl.[2] G01K 7/06
U.S. Cl. 73—341 8 Claims

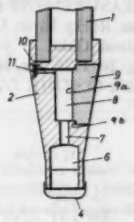


1. A temperature sensor for monitoring the temperature of an elongated slender target comprising a hollow cylindrical housing of heat conductive material, flanged cap members, one fitted on each end of the housing, openings in the center of each cap member providing access to the interior of the housing and located on the axis thereof, and a plurality of sensor units fixed to the interior wall of the housing and extending axially thereof, each sensor unit comprising an elongated electric non-conductive substrate, a wire winding on said substrate, the wire being made up of different materials adapted to form thermocouples at their junction points and being so wound on the substrate as to provide a multiplicity of axially aligned hot junctions along one surface of the substrate and a multiplicity of axially aligned cold junctions along an opposite surface of the substrate, the sensor units being connected in series and the end terminals of the series being adapted for connection to an instrument.

4,102,197
SAMPLING MOLTEN STEEL

Freidrich Bardenheuer, Krefeld, Germany, and Gustav Kolb, 5984 Garbeck, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf and Gustav Kolb, Garbeck, both of Germany, part interest to each

Filed Mar. 7, 1977, Ser. No. 775,160
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609945
Int. Cl.[2] G01N 1/12
U.S. Cl. 73—354 15 Claims

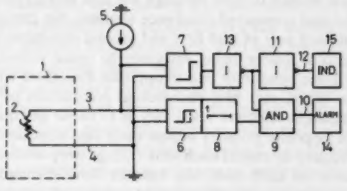


1. A ceramic sampling device for sampling molten steel, comprising:
a single piece body having an entrance chamber, an inlet duct extending from the chamber to a mold cavity of disc-shaped configuration, but being defined by an open configuration of the body, the body further including a venting duct and destructible means for closing the venting duct; and
a stopper inserted into and affixed to the body at said open configuration and providing a mold-completing surface as to one flat side of the disc, said stopper and mold completing surface having a diameter equal to the diameter of the disc.

4,102,198
RESISTANCE THERMOMETER MEASURING SYSTEM

Gudmar Hammarlund, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Oct. 6, 1976, Ser. No. 730,249
Int. Cl.[2] G01K 7/16
U.S. Cl. 73—362 AR 5 Claims



1. A resistance thermomenter measuring system comprising:
a temperature responsive resistance member, said resistance member having two connection leads;
current supply means for supplying current to said resistance member;
a first voltage sensing means coupled in parallel with said resistance member and serving to provide an alarm signal

a preselected time after the voltage across said resistance member exceeds a first preset level corresponding to a preselected temperature of said resistance member;

second voltage sensing means coupled in parallel with said resistance member and serving to provide a malfunction indicating signal immediately after the voltage across said resistance member exceeds a second level, such second level being higher than the first level and indicative of a malfunction in said resistance member such malfunction occurring when there is an interruption in the portion of the circuit formed by said resistance member and its connecting leads; and,

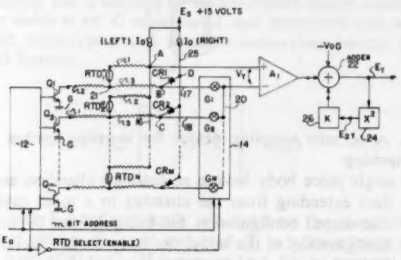
means for combining said alarm signal and said malfunction indicating signal and for blocking said alarm signal when both signals appear simultaneously.

4,102,199

RTD MEASUREMENT SYSTEM

Panayiotis J. Tsipouras, Rocky River, Ohio, assignor to Mega-systems, Inc., Cleveland, Ohio

Filed Aug. 26, 1976, Ser. No. 717,936
Int. Cl.² G01K *7/24*
U.S. Cl. 73—362 AR **6 Claims**



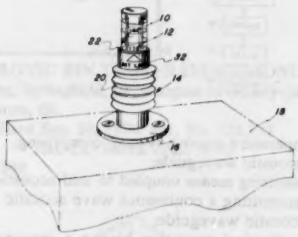
1. A measurement system for electrically determining the temperature at a plurality of locations of interest comprising, a resistance-temperature device disposed at each said location and having a resistance element exposed to the temperature at said location and whose magnitude of resistance is responsive to and related to the temperature thereat, a plurality pf pairs of first and second conductors, each pair connecting across one of said resistance elements and to a source of constant current, first circuit means having third conductor means separately connecting with one end of each said resistance elements, said first circuit means including switch means operable to separately connect each said third conductor means and said connected resistance element to the ground of said system, means for sequentially operating said switch means to sequentially connect each said connected resistance element between said system ground and source of current thereby causing current from said source to flow through the first and second conductors and said connected resistance element, the circuit connections of each pair of said first and second conductors with the said current source being effective to cause current to flow through said conductor pair in opposite directions with respect to each other, said first and second conductors of each pair being equal in effective resistivity as to cause an equal voltage drop of opposite polarity across each said conductor of each pair effective to cancel each said voltage drop across each said conductor of each pair, the current flow through the connected resistance element causing a first voltage signal to be developed thereacross whose magnitude is proportional to the temperature at said location, second circuit means connecting across each said resistance element and providing an output voltage signal that is proportional to the first voltage signal, means providing a second voltage signal whose magnitude is equal to the output voltage signal of the second circuit means when the temperature at the selected location of interest is zero, said second circuit means including an adder circuit operable to add said first voltage signal to a second voltage signal of opposite sign when the selected resistance element is connected between said system ground and source of current to provide a difference voltage signal therebetween, and means for providing a third voltage signal and for mixing said third voltage signal with said difference voltage signal effective to provide a temperature indicator voltage whose magnitude is linearly directly proportional to the temperature at the selected location of interest.

4,102,200

TEMPERATURE INDICATOR

Joseph R. Kelsch, Jr., 31 Sioux Dr., Commack, N.Y. 11725

Filed Nov. 2, 1976, Ser. No. 738,376
Int. Cl.² G01K *1/02*
U.S. Cl. 73—371 **6 Claims**



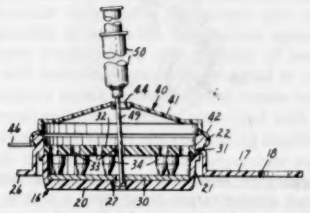
1. A temperature indicator comprising: a graduated electroluminescent tube which glows along a length in accordance with the movement of temperature-responsive liquid up and down the tube, an opaque expansible sleeve encasing said tube whereby the top edge of said sleeve is alignable with a graduation on said tube with the sleeve covering the entire tube below said graduation, and means connected to said sleeve for mounting said sleeve and tube on an object, the temperature of which is to be sensed.

4,102,201

VAPOR SAMPLING AND ANALYTICAL DEVICE

John A. Trine, Landfall, and David L. Braun, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 26, 1977, Ser. No. 836,760
Int. Cl.² G01N *1/22*
U.S. Cl. 73—421.5 R **17 Claims**



15. A method of determining the amount of at least one selected component of a fluid mixture comprising the steps of:

collecting the selected component by exposing said fluid mixture for a measured period of time to a collecting layer disposed within a chamber formed by body members and having an open end with at least one porous attenuating layer disposed across said open end to allow passage of said fluid into said chamber;

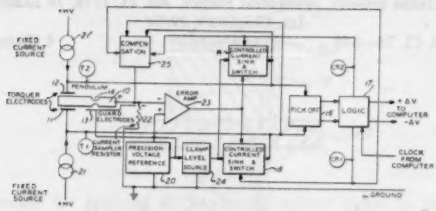
sealing said chamber at the expiration of said measured period;

adding to said chamber a measured amount on an elutant to desorb the selected component from said collecting layer;
withdrawing an aliquot of the elutant containing the selected component;
analyzing the solution to determine the amount of the selected component present therein.

4,102,202
ELECTROSTATIC ACCELEROMETER

Lincoln Stark Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 26, 1976, Ser. No. 745,259
Int. Cl.[2] G01P *15/00*
U.S. Cl. 73—517 B **7 Claims**



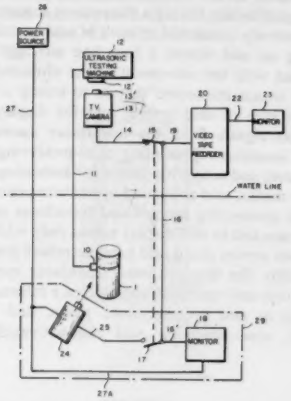
1. An electrostatic accelerometer comprising:
a conductive pendulous mass pivotally movable about a hinge point said pendulous mass being responsive to acceleration along a sensing axis,
first and second electrodes disposed on the opposite sides of said pendulous mass and in capacitive relation therewith,
sources of constant current connected to said electrodes for building up a charge on said electrodes to enable said electrodes to force said pendulous mass to its null position, said charge on said electrodes being indicative of the position and direction of said pendulous mass from null,
a high gain differential amplifier said pendulous mass connected to a first input of said amplifier,
a source of reference voltage connected to a second input of said amplifier,
a resistance means connected between ground and said first amplifier input whereby said amplifier is capable of maintaining a zero potential difference between said first and second amplifier inputs through action of said constant current sources connected as control loops, and
means responsive to said charge on said electrodes for measuring the position and direction of displacement of said pendulous mass from null position.

4,102,203
UNDERWATER INSPECTION AND COMMUNICATION APPARATUS

Bruce J. Sylvester, Duxbury, and Roger P. Sylvester, Kingston, both of Mass., assignors to J. G. Sylvester Associates, Inc., Rockland, Mass.

Filed Dec. 16, 1976, Ser. No. 751,143
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—620 **10 Claims**

1. A system for conducting ultrasonic inspection of a structure submerged below a water surface, comprising;
a mobile subsurface unit comprising transducer means for transmitting bursts of high frequency sound waves through one surface of said structure and detecting reflections of said sound waves, and monitoring means for monitoring the magnitude of the sonic signals generated by manipulation of the transducer means over the surface of the structure, said transducer means being movable over the surface of said structure apart from the monitoring means; and
above-surface equipment comprising image-forming means for forming a visual image demonstrating the signals transmitted and detected by said transducer means; connecting means, connected to said image-forming means and said transducer means, for conveying signals transmitted or

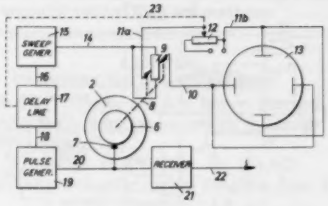


detected by said transducer means to said image-forming means; and image-transmitting means for transmitting the visual signal formed by the image-forming means to the monitoring means in said subsurface unit.

4,102,204
ULTRASONIC SECTION PLANE EXAMINATION AND DISPLAY

Carl Kretz, Redl 20, Zipf, Austria

Filed Dec. 10, 1976, Ser. No. 749,539
Claims priority, application Austria, Dec. 23, 1975, 9777/75
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—626 **24 Claims**



1. Equipment for ultrasonic examination of a specimen in a section plane and for producing moving section plane pictures in response to said examination, comprising, in combination, an ultrasonic transducer head having a predetermined peripheral portion, said predetermined peripheral portion having an outside surface adapted to be contacted with said specimen in a predetermined section plane, said ultrasonic transducer head comprising a stationary housing having an internal cavity circular in shape at least throughout the sector subtended by said predetermined peripheral portion, and said ultrasonic transducer head further comprising a wheel mounted in said housing for rotation around an axis spaced inwardly from said peripheral portion and eccentrically thereto, the periphery of said wheel and said internal surface of said stationary housing defining a gap extending around said periphery of said wheel and having the smallest width in said sector; a sound transmitting liquid filling said gap; a plurality of ultrasonic transducer means peripherally spaced around said wheel and adapted to revolve therewith around said axis, for projecting an ultrasonic beam through said peripheral portion into said specimen upon activation thereby causing said beam to perform an angular movement in said predetermined section plane, and for receiv-

ing, through said peripheral portion, echoes originating at echo-producing portions of said specimen in said section plane in response to said beam and generating corresponding echo signals; control means for operating each of said transducer means; display means having a fluorescent screen and adapted to be operatively connected to each of said transducer means, for tracing on said screen a base line moving angularly in synchronism with the movement of the ultrasonic beam of a transducer means connected thereto to sweep a substantially trapezoidal area of said screen, and for displaying on said screen echo signals from the transducer means connected thereto at locations representing echo-producing portions of said specimen; and activating means for activating each of said transducer means, said activating means comprising means for operatively connecting each of said transducer means to said control means and to said display means only while said transducer means moves along said predetermined peripheral portion, whereby the thus-activated transducer means projects said beam into said specimen and sweeps a substantially trapezoidal area in said predetermined plane, said substantially trapezoidal area adjoining said thus-activated transducer means.

4,102,205

METHOD AND APPARATUS FOR ULTRASONIC NONDESTRUCTIVE TESTING OF WORKPIECES WITH AUTOMATIC COMPENSATION FOR THE PROBE, WORKPIECE MATERIAL, AND TEMPERATURE

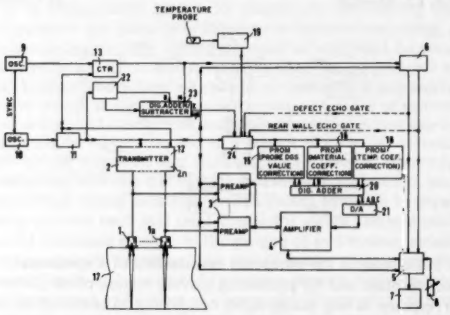
Wilfried Pies, Erftstadt-Blisesheim, and Reinhard Brandt, Turnich, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed May 4, 1977, Ser. No. 793,611

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623522

Int. Cl.² G01N *29/04*

U.S. Cl. 73—626 **11 Claims**



1. The method of testing workpieces by the ultrasonic pulse-echo method comprising:

coupling a plurality of electroacoustic transducer probe means via a coupling means to the surface of a workpiece to be tested;

storing in memory means, digitally addressed with respect to predetermined workpiece test regions, data relating to each of the probe means and data relating to the workpiece properties;

energizing said probe means for causing each of said probe means to transmit an ultrasonic search signal into the workpiece and subsequently to provide an echo responsive electrical signal arising from a respective search signal intercepting an acoustic discontinuity in the workpiece;

responsive to said probe means being energized addressing said memory means for continuously retrieving the respective probe means and workpiece properties stored data corresponding to the workpiece region traversed by the respective search signal;

combining the retrieved stored data from the memory means for forming a compensating signal;

compensating an echo responsive signal as a function of the compensating signal to derive a compensated output signal, and

evaluating said compensated output signal.

4,102,206

DEVICE FOR INSPECTING A TUBE BY ULTRASONICS

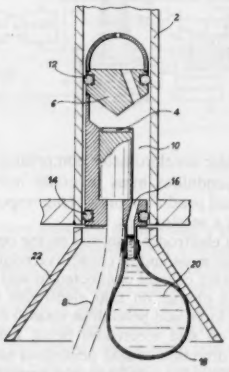
Jean Perdijon, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 5, 1977, Ser. No. 813,098

Claims priority, application France, Jul. 21, 1976, 76 22208

Int. Cl.² G01N *29/04*

U.S. Cl. 73—644 **4 Claims**



1. A device for introducing an acoustic coupling liquid into a volume defined by an acoustic inspection probe and the walls of a tube to be inspected as the probe is inserted into said tube, comprising a flexible pocket reservoir filled with said liquid and associated with a lower portion of said probe, and a conduit between said pocket reservoir and the volume to be filled, whereby said pocket reservoir is compressed as the probe is inserted into said tube and at least part of the liquid in said reservoir is expelled via said conduit into the volume, said liquid returning to the pocket via said conduit under the force of gravity as the probe is removed from the tube permitting the flexible pocket to reassume its original shape.

4,102,207

ELECTROMAGNETIC ULTRASOUND TRANSDUCER

Harold M. Frost, Rockville, Md., and Thomas L. Szabo, Boston, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 16, 1976, Ser. No. 751,240

Int. Cl.² G01N *29/00*

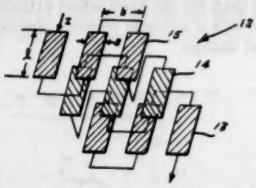
U.S. Cl. 73—643 **1 Claim**

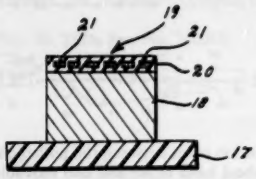
1. An electromagnetic ultrasound transducer comprising the combination of

a flexible permanent magnet,

a plurality of flexible multiconductor flat cable segments, the several conductors of each said segment being interconnected to provide a meander type electromagnetic transducer circuit, said flat cable segments being stacked in a contiguous layered arrangement and interconnected to provide a single continuous meander transducer circuit having a terminal at each end thereof, the stack of cable segments being affixed to one surface of said magnet, the

magnet magnetization axis being substantially perpendicular to the plane surfaces of said flat cable segments, and





means for applying an alternating current signal to said transducer circuit terminals.

4,102,208

SOUND LEVEL METER

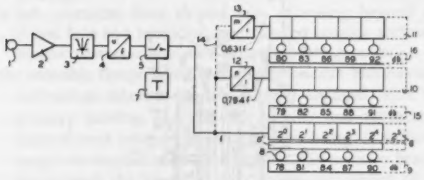
Tilman Betz, Groebenzell, Germany, assignor to Rohde and Schwarz, Germany

Filed Apr. 6, 1977, Ser. No. 785,014

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616585

Int. Cl.² G01H *3/12*

U.S. Cl. 73—647 **19 Claims**



1. A sound level meter, comprising:

signal receiving means for receiving and converting sound level into a corresponding electrical signal;

exponentiating means connected to said signal receiving means to raise the values of the electrical signal to a higher power;

converting means for converting the electrical voltage amplitude of the electrical signals of the exponentiating means into a corresponding frequency;

multistage binary counting means for counting pulses applied thereto;

a plurality of individual indicators connected to respective stages of the counter;

a dB scale associated with said indicators;

gating means connected between said converting means and said binary counting means; and

timing means controlling said gating means and operable to open said gating means for a predetermined interval.

4,102,209

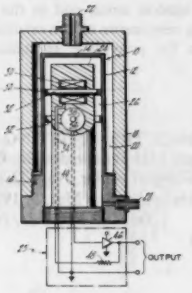
TEMPERATURE COMPENSATED VIBRATING CYLINDER PRESSURE TRANSDUCER

Charles B. Brahm, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 17, 1977, Ser. No. 807,625

Int. Cl.² G01L *19/04*

U.S. Cl. 73—702 **5 Claims**



1. A vibrating cylinder pressure transducer for measuring the pressure of a fluid, comprising:

a housing having an internal cavity forming an outer pressure chamber;

a cylinder disposed within said cavity and sealed with respect thereto, said cylinder having sidewall, which vibrates in operation and an end wall, defining an inner pressure chamber;

drive means for creating magnetic flux to act upon said sidewall of said vibrating cylinder;

pickup means disposed adjacent said sidewall for sensing movement of said vibrating cylinder; and

means having a high permeability at high temperature disposed on the sidewall of said vibrating cylinder adjacent said drive and pickup means for providing a low reluctance magnetic path at high temperatures.

4,102,210

PRESSURE TRANSDUCERS

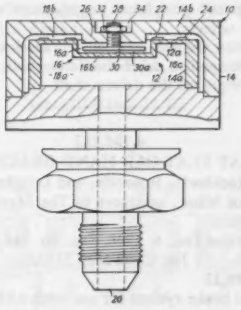
Frederick Robert Couston, and Roy Robert Bannock, both of Basingstoke, England, assignors to Bell & Howell Limited, Basingstoke, England

Filed Mar. 15, 1976, Ser. No. 666,627

Claims priority, application United Kingdom, Mar. 18, 1975, 11297/75

Int. Cl.² G01L *9/06*

U.S. Cl. 73—727 **14 Claims**



1. A transducer responsive to pressure, comprising a diaphragm having first and second opposed surfaces and a cup-

shaped portion formed concentrically in said diaphragm, said cup-shaped portion having external and internal surfaces forming part of said first and second surfaces respectively of said diaphragm, means for rigidly securing said diaphragm around its periphery to define an annular portion thereof between said periphery and said cup-shaped portion, means for applying a pressure to the first said surface of the diaphragm to produce in the annular portion an area of tension stress and an area of compression stress and means disposed on said annular portion in the area of tension stress and in the area of compression stress and being responsive to the resulting axial deflection of said diaphragm for providing an indication of the applied pressure.

4,102,211

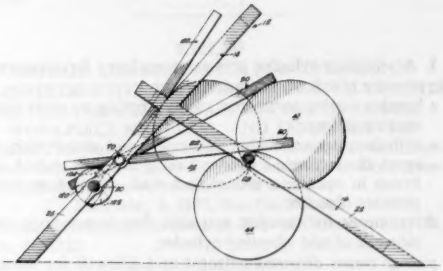
FORCE TRANSMITTING MEANS

Carlos Amortegui, 1116 Wilmington St., Opa Locka, Fla. 33054

Continuation-in-part of Ser. No. 632,475, Nov. 17, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,732

Int. Cl.[2] F16H *21/14*

U.S. Cl. 74—66 **1 Claim**



1. A force transfer device comprising:

a frame,

a first and a second pair of bifurcated legs, each pair extending at an angle with respect to one another,

a drive shaft spanning said first pair of legs,

three eccentric wheels of common diameter equi-angularly fixed to said shaft and equi-spaced from one another on said shaft and keyed for rotation with said shaft,

a driven shaft spanning the second pair of legs and a plurality of wheels on said shaft of a diameter less than said eccentric wheels and spaced from one another defining a plurality of adjacent axially spaced annular slots therebetween,

pivot means spanning said second pair of legs above said driven shaft; and

lever means pivotally connected to said pivot means and comprising a plurality of levers, each lever including a first portion in one of the slots between said wheels of said driven shaft and each lever including a second portion extending into peripheral engagement with one of said eccentric wheels,

whereby when the eccentric wheels are rotated by operator means arranged to drive the drive shaft, the lever means exert a torque on the driven shaft.

4,102,212

RAILWAY FLAT CAR HAND BRAKE SYSTEM

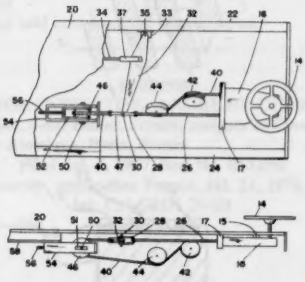
Richard W. Hackbarth, Roseville, and Douglas A. Puariea, St. Paul, both of Minn., assignors to The Maxson Corporation, St. Paul, Minn.

Filed Dec. 6, 1976, Ser. No. 748,120

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.22 **7 Claims**

1. In a hand brake system for use with a railway flat car of the type in which the brakes are activated by suitable mechanical linkage connecting the brakes to a standard vertical wheel high powered hand brake of the non-reel type wherein a pulled chain from the vertical wheel hand brake is connected to the mechanical linkage and an idle chain drops loosely out of the brake housing, the improvement comprising the positioning of said vertical wheel hand brake horizontally below the flat car deck with the shaft for the hand wheel extending up through the deck; and with a movable member connected to operate the mechanical linkage;



a connection point between the pulled chain from the vertical wheel hand brake and said movable member; and

an idle chain take up and return means positioned to convey the idle chain from the vertical wheel hand brake to said movable member connection point employed by the pulled chain but from the side of the member opposite the pulled chain.

4,102,213

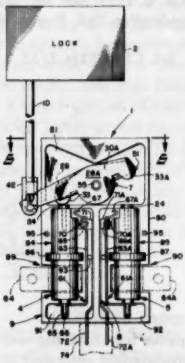
DOOR LOCK ACTUATOR UNIT

Lynn C. Smith, Willoughby Hills, Ohio, assignor to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Oct. 15, 1976, Ser. No. 732,652

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—110 **10 Claims**



1. An actuator unit comprising two selectively energized spaced linear actuators each having an expansion stroke and a contraction stoke, said actuators being contracted when deenergized, a pivotally mounted lever assembly positioned adjacent said actuators to place the pivotal mount between the actuators and respectively to align each side of the lever assembly with the actuators for selective engagement thereby, output means connected to said lever assembly to be moved between at least two positions by the pivotal movement of the lever assembly, control means operative selectively to energize either of said actuators during the entire expansion stroke thereof during which the side of the lever assembly aligned therewith is engaged pivotally to move the assembly to change the position of the output means and then to deenergize the same for its contraction stroke to complete its cycle in its

normally contracted condition, the lever assembly including a lost motion means to permit an energized actuator normally to complete its expansion and contraction cycle even if the output means is being held to preclude movement to the position that would normally result from energization of said actuator.

4,102,214

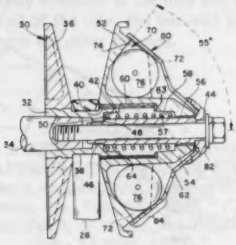
VARIABLE-SPEED PULLEY AND CLUTCH

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Nov. 18, 1976, Ser. No. 742,834

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 E **19 Claims**



1. A variable-speed pulley, comprising a fixed pulley flange and a movable pulley flange movable toward and away from the fixed pulley flange to vary the width of the belt-receiving groove,

said fixed flange being carried by a pulley hub extending across the pulley groove, having a cylindrical primary bearing of substantial length at the opposite side of the groove, and having an end thrust face at the end of said bearing,

a hub extension fixed to said hub, extending beyond said thrust face and providing an extended bearing surface of smaller diameter than said primary bearing surface,

the movable flange being carried by a sleeve hub having a cylindrical inboard bearing surface engaged with said primary bearing and movable axially and rotationally thereof, said inboard bearing surface being of sufficient length to support the sleeve hub on said primary bearing throughout the opening and closing movement of the movable flange,

a thrust face on the sleeve hub radially inward of said inboard bearing surface and positioned to engage the end thrust face of said pulley hub so as to limit the closing movement of the pulley flanges,

an outboard bearing on said sleeve hub, axially beyond and radially inward of said thrust faces, engaged with the extended bearing surfaces of the hub extension, and movable along said extension so as to support said movable pulley flange throughout its movement,

a reaction member fixed at the end of said hub extension,

centrifugal weights acting between the movable pulley flange and said reaction member and operative to move the movable flange in pulley-closing direction in response to centrifugal force generated by rotation of the pulley,

said structure being adapted to receive one or more spacers between said thrust faces on the pulley hub and sleeve hub and thereby vary the closed width between the ulley flanges.

4,102,215

MULTI-SPEED FREEWHEEL FOR A BICYCLE

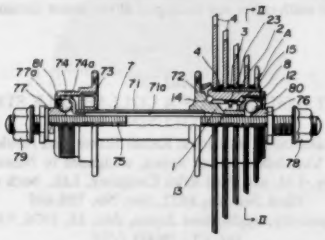
Masashi Nagano, and Koya Sonoi, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed May 11, 1977, Ser. No. 795,886

Claims priority, application Japan, May 19, 1976, 51-64690[U]; May 19, 1976, 51-64691[U]

Int. Cl.² F16H *55/30, 9/00, 11/08*

U.S. Cl. 74—243 DR **15 Claims**



1. A multi-speed freewheel mounted to a hub of a bicycle, said multi-speed freewheel comprising,

a. a cylindrical inner member fixed to said hub,

b. a cylindrical outer assembly having inner and outer peripheries, said assembly being mountable onto an outer periphery of said inner member so as to be rotatably supported with respect to said inner member,

said outer assembly having on its outer periphery spaced configurations directed axially of said outer assembly,

c. a unidirectional transmission provided between the outer periphery of said inner member and the inner periphery of said outer assembly,

said transmission serving to transmit unidirectional rotation from said outer assembly to said inner member,

d. a sprocket-block having an inner periphery mountably engageable with the outer periphery of said outer assembly,

said sprocket-block comprising a plurality of sprockets each having a center hole of a diameter larger than that of the outer periphery of said outer assembly, said sprockets being aligned at regularly spaced intervals longitudinally of said outer assembly, the surface of each sprocket defining said hole having spaced configurations thereon engageable with the configurations of said outer assembly, and

e. means for fixing said sprocket-block to said outer assembly after said sprocket-block is mountably engaged thereon.

4,102,216

DRIVING CHAIN FOR BICYCLES

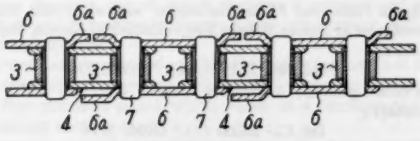
Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 6, 1976, Ser. No. 748,144

Claims priority, application Japan, Dec. 29, 1975, 51-180311[U]

Int. Cl.² F16G *13/02*

U.S. Cl. 74—245 R **2 Claims**



1. A driving chain for a bicycle, which transmits a driving force by pedalling from front chain sprockets to rear chain

sprockets, comprising a plurality of inner link plates defining bush holes, a plurality of outer link plates defining pin holes and pins connecting the outer and inner link plates lengthwise through said holes, said pins projecting at axially both ends thereof outwardly from the outer surface of the outer link plates, said outer link plates being expanded outwardly at the intermediate portions between a pair of pins at both ends lengthwise of said outer link plates to the extent that said pins project from the outer surface of said outer link plates, so that the expanded portions are contactable with the teeth of an adjacent sprocket and said outer link plates in relation of being opposite to each other are enlarged at the inner distance therebetween.

4,102,217

SUPPORT ASSEMBLY OF A COLLAPSIBLE STEERING COLUMN

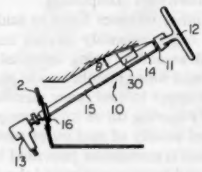
Yoshimi Yamamoto, Shizuoka; Kazuo Ikawa, and Naoki Ogawa, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd. and Fuji Kiko Company, Ltd., both of, Japan

Filed Jan. 11, 1977, Ser. No. 758,405

Claims priority, application Japan, Jan. 13, 1976, 51-1792[U]

Int. Cl.[2] B62D *1/16*

U.S. Cl. 74—492 **3 Claims**



1. In an automotive collapsible steering column assembly with a telescopically movable portion, the combination comprising,

a clamp attachment fixed to the telescopically movable portion of the steering column and having a top panel extending in the longitudinal direction of the steering column, said top panel including one longitudinal end formed with an upwardly directed, hook-shaped extension and an opposite longitudinal end,

a clamp plate secured to a part of the vehicle body and being laid upon said top panel in slidable engagement therewith, said clamp plate having one longitudinal end formed with a downwardly directed, hook-shaped extension engageable with the opposite end of said top panel and an opposite longitudinal end, said clamp plate having means for preventing lateral displacement of the clamp plate with respect to the clamp attachment,

means for combining said clamp plate and said top panel of the clamp attachment together, said means being breakable under a predetermined impact force applied thereto to permit said clamp attachment to slide off said clamp plate.

4,102,218

FASTENING DEVICE FOR TILTABLE STEERING MECHANISMS

Mitsuru Naka, and Masao Sakamoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 3, 1977, Ser. No. 803,270

Claims priority, application Japan, Dec. 24, 1976, 51-174866[U]

Int. Cl.[2] B62D *1/18*; G05G *5/18*

U.S. Cl. 74—493 **10 Claims**

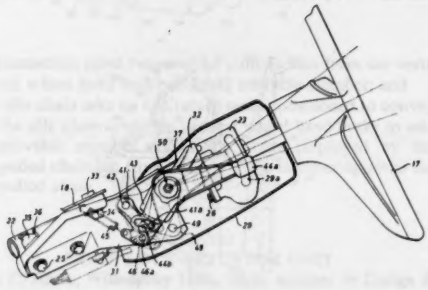
1. In an automotive vehicle, a fastening device for a tiltable steering mechanism including a steering shaft tiltably connected to steering gear means, a tubular housing having said steering shaft journalled therein, and a steering wheel mounted on said steering shaft, comprising:

a stationary bracket mounted on a portion of the vehicle body structure and having a pair of opposing arms;

a movable bracket secured to said tubular housing and having a pair of opposing arms coupled and pivoted to the pair of arms of said stationary bracket for permitting angular adjustment of said steering shaft and said steering wheel;

a toothed portion united with one of the arms of said movable bracket;

a latch member pivoted to a portion of said stationary bracket and movable between a locked position in which said latch member engages said toothed portion to lock said steering wheel in a desired angular position and an unlocked position in which said latch member disengages from said toothed portion to permit free movement for angular adjustment of said steering wheel;



a manual lever pivoted to said stationary bracket coaxially with said movable bracket to be moved perpendicularly with respect to the pivot axis and being operatively connected with said latch member to move said latch member toward the unlocked position;

an engaging element provided on said manual lever and engageable with the bottom face of said latch member to hold said latch member in the locked position when said manual lever is released; and

resilient means for biasing said manual lever to maintain the engagement of said latch member against said toothed portion of said movable bracket;

whereby when said manual lever is operated against biasing of said resilient means, said engaging element is separated from said latch member to permit movement of said latch member from the locked position to the unlocked position.

4,102,219

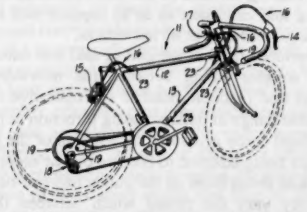
FAIR-LEADS FOR A CONTROL WIRE

Gerhard R. Plamper, Valley City, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Aug. 19, 1977, Ser. No. 826,023

Int. Cl.[2] F16C *1/10*

U.S. Cl. 74—502 **6 Claims**



4. In a vehicle such as a bicycle or the like having an elon-

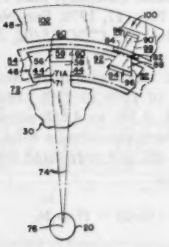
gated tube as part of its structure and having a Bowden type control wire under tension operable by the operator for controlling a function of the vehicle, the said tube having a pair of openings in the side wall thereof at spaced locations along the tube, the combination of a pair of fair-leads mounted in said openings, respectively, for guidance of the control wire to within the tube at one of said openings and outwardly from the tube at the other of said openings, said fair-leads having bores extending therethrough for accommodating said control wire, the bore in said each of said fair-leads being at an acute angle to the axis of the tube and being inclined toward the other of said fair-leads whereby the control wire extends through the fair-leads at such acute angles and the wire under tension urges the fair-leads in said openings toward each other, each said fair-lead interiorly of the tube at the end of the fair-lead directed toward the other fair-lead in the other opening having a shoulder overlapping the inner side wall of the tube at such end to resist movement of the fair-lead outwardly of the tube in a direction radially outward of the tube, the wire under tension exerting such a component of force on the fair-lead as to urge the fair-lead radially inwardly of the tube and to press against the outer side wall of the tube, the fair-lead at the other end directed away from the other opening.

4,102,220

MULTI-RING INERTIAL ENERGY STORAGE WHEEL HAVING TAPERED RING MOUNTING MEMBERS

William M. Brobeck, Orinda, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 1, 1976, Ser. No. 701,825
Int. Cl.² F16C *15/00*
U.S. Cl. 74—572 **21 Claims**



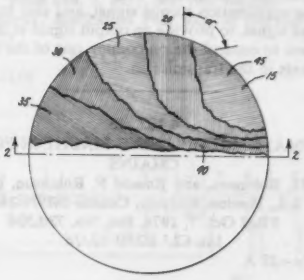
1. In an inertial energy storage wheel having at least one rotor, the rotor including an axially oriented end face and a plurality of radially oriented grooves in the end face, a plurality of radially oriented connecting members having a shape complementary to a shape of the grooves and disposed therein, the connecting members protruding in a radial direction past the grooves, and mounting means radially spaced from the rotor and attached to the connecting members for the transmission of rotational forces between the rotor and such means, the improvement to the rotor and the connecting member comprising: a connecting member having diverging sides extensions of which generally intersect at an axis of the rotor, and a groove in the rotor having side walls which diverge in accordance with the sides of the connecting member to form a snug fit between the sides and the side walls when the rotor is at rest, the divergency of the sides and of the side walls having a magnitude and an orientation such that upon dilation of the rotor during its rotation, the rotor and the connecting members are permitted to move with respect to each other in a radial direction while the sides and the side walls of the connecting members and the grooves, respectively, remain in mutual contact and engagement and maintain their snug fit.

4,102,221

CROSS-PLY COMPOSITE FLYWHEEL

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,896
Int. Cl.² F16F *15/30*
U.S. Cl. 74—572 **14 Claims**



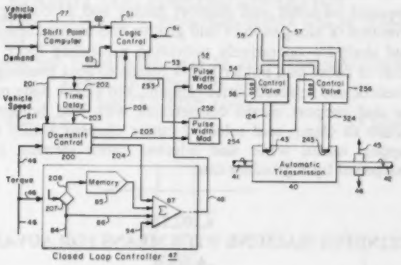
1. A flywheel comprising a plurality of fiber layers, the fibers of each layer being parallel to each other and extending in radial and chordal directions, said layers being embedded in a monolithic matrix of binder material, the fibers of each successive layer being oriented at a single predetermined angle to those of the preceding adjacent layer such that at least four layers of fibers are disposed between any two layers in which the fibers of said two layers extend substantially parallel to each other, said predetermined angle having a value between approximately 70° and approximately 110°.

4,102,222

TRANSMISSION CONTROL SYSTEM

Alan Leonard Miller, Mount Prospect, and Werner Paul Petzold, Harwood Heights, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 3, 1977, Ser. No. 756,470
Int. Cl.² B60K *41/10*
U.S. Cl. 74—866 **15 Claims**



1. An electronic control system for regulating change of gear ratio in a vehicle having an engine and an automatic transmission with input and output mechanical driving connections, which transmission also has first and second controllable friction elements, one of which elements is released and the other of which is engaged during a gear ratio change, which system comprises:

a transducer, positioned to sense the output torque To at the transmission output driving connections and to provide a first electrical signal which varies as a function of the output torque;

means for providing a vehicle speed signal, and for operating on the vehicle speed signal to produce a second electrical signal which is also a function of the transmission gear ratios and the engine inertia;

additional means connected to modify the second electrical signal in accordance with a predetermined time Δt over which the engine speed is to be changed from a first value to a second value, thus providing a calculated engine acceleration torque signal; and

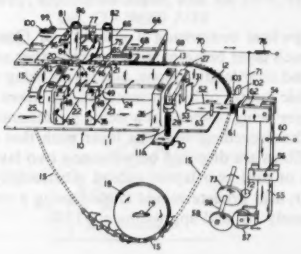
means, including an output summation stage, connected to receive a third signal which is the integrated difference between the initial torque signal To and the calculated engine acceleration torque signal, and also to receive the second signal, to provide an output signal at the appropriate time to control the on-coming one of the controllable elements in the transmission.

4,102,223

AUTOMATIC SHARPENING MACHINE FOR SAW CHAINS

Geoffrey H. Robinson, and Ronald F. Robinson, both of 2598 Weston Rd., Weston, Ontario, Canada (M9N 2A8)

Filed Oct. 7, 1976, Ser. No. 730,336
Int. Cl.[2] B23D *63/16*
U.S. Cl. 76—25 A **16 Claims**



1. In a machine for automatically sharpening cutter elements of a saw chain, an apparatus for mounting said saw chain comprising a support means having an elongated groove therein operative for receiving said saw chain to be slidably mounted thereon, holder finger means for engaging mounting rivets of a selected cutter element in said saw chain, said holder finger means being carried by at least one rectangular block body which is adjustably mounted on a rotatable keyed shaft disposed adjacent said support means and extending in the direction of elongation of said groove bias means connected to said shaft for operatively providing a rotating force to said shaft to cause said holder finger means to abut pressingly said rivets of said selected cutter element, and a back plate mounted on said support means cooperative with said holder finger means to clamp said selected cutter element firmly on said support means while said selected cutter element is being sharpened by a grinding disc.

4,102,224

GRINDING MACHINE WITH MEANS FOR ADVANCING A SAW

James L. Wright, 81085 N. Beech Rd., Creswell, Oreg. 97426

Filed Apr. 6, 1977, Ser. No. 785,194
Int. Cl.[2] B23D *47/04*
U.S. Cl. 76—79 **7 Claims**

1. In a grinding machine for grinding the teeth in a circular saw, a frame,

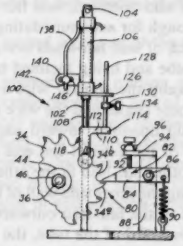
holding means mounted on said frame for holding the saw at the eye region thereof with the saw rotatable about its axis,

an indexing device mounted on said frame spaced radially from the axis of a saw so held adapted to have a tooth of the saw rest thereagainst thus to position the saw tooth for grinding,

first clamp mechanism mounted on said frame for clamping a saw held by said holding means, and

saw-advancing means for rotating in increments a saw held by said holding means thus to place successive teeth in a position resting against said indexing means,

said saw advancing means comprising a second clamp mechanism spaced from the first clamp mechanism for clamping onto opposite bases of the saw at a location spaced radially from the axis of the saw,



said second clamp mechanism on being clamped onto a saw and on rotation of the saw riding with the saw in an arcuate path spaced radially from said axis of the saw

and power-operated means operatively interposed between said frame and said second clamp mechanism for imparting movement to said clamp mechanism in said arcuate path and with such movement rotational movement to the saw.

4,102,225

LOW CHROMIUM OXIDATION RESISTANT AUSTENITIC STAINLESS STEEL

Harold Thomas Michels, Manhasset, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 17, 1976, Ser. No. 742,429
Int. Cl.[2] C22C *38/02, 38/06*
U.S. Cl. 75—124 **9 Claims**

1. An austenitic nickel-chromium stainless steel alloy consisting essentially of 10% to 15% chromium, about 10% to about 18% nickel, 0.5% to 4.5% silicon and 0.5% to 4.5% aluminum in amounts providing a total silicon-plus-aluminum content of 2% to 7% and correlated with the chromium content to provide that

$$\%\,Cr + 2(\%Si + \%Al) = 19 \text{ to } 24,$$

0.02% to 0.15% carbon, up to 0.7% titanium, up to 2% manganese, up to 0.05% magnesium and balance essentially iron in an amount at least 60% of the alloy.

4,102,226

JAR OPENING APPARATUS

John McGuire, 198-40 32nd Ave., Bayside, N.Y. 11360

Filed May 2, 1977, Ser. No. 792,718
Int. Cl.[2] B67B *7/36*
U.S. Cl. 81—3.33 **4 Claims**

1. An apparatus for opening a cover of a container comprising:

(a) a base;

(b) means on said base for securing a container in a stationary position;

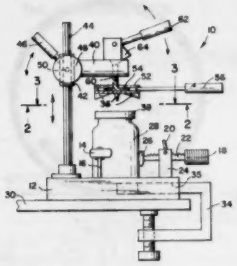
(c) arm means adjustably secured to said base;

(d) positioning means on said base for releasably securing said arm means in a variety of vertical positions above said base;

(e) gripping means movably secured to said arm to contact said cover;

(f) said gripping means comprising a plate and means on said arm means for adjusting the position of said plate relative to said arm means; a disc shaped sleeve member slidably

and rotatably secured to said plate by means of an enlarged slot encompassing a said plate and;



(g) gripping surfaces on said sleeve member for gripping said cover.

4,102,227

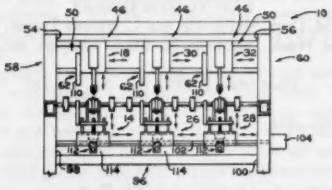
METHOD OF AND APPARATUS FOR ALIGNING A SCORING WHEEL WITH A SUPPORT WHEEL

Gabriel Simko, Springdale Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 3, 1976, Ser. No. 682,425

Int. Cl.[2] B26D *3/08*

U.S. Cl. 83—7 **20 Claims**



1. A method of positioning in predetermined spaced relationship respective ones of a first set of a plurality of discrete objects mounted for movement along a first predetermined path with respective ones of a second set of a plurality of discrete objects mounted along a second predetermined path, wherein the first and second predetermined paths are in spaced relationship to one another, comprising the steps of:

mounting the objects of the second set in a predetermined spaced relationship with one another along the second predetermined path;

applying a common force to each of the objects of the first set to simultaneously urge the objects of the first set along the first predetermined path in a direction to position a selected one of the objects of the first set in predetermined spaced relationship with its respective one of the objects of the second set; while

preventing movement of the remaining ones of the objects of the first set as the common force moves the selected object of the first set towards its respective one of the objects of the second set to position same in a predetermined spaced relationship to one another; and

repeating said applying and preventing steps on the remaining objects of the first set to position the remaining objects of the first set in a predetermined spaced relationship with their respective objects of the second set.

4,102,228

CUTTING APPARATUS

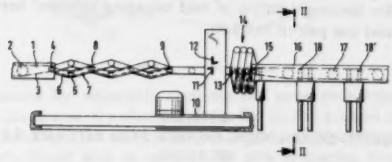
Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, Wuppertal-Barmen; Wolfgang Hellkotter, Dortmund; Albert Einhaus, Hagen, and Karl Robert Buschmann, Gevelsberg, all of Fed. Rep. of Germany, assignors to Carl Ullrich Peddinghaus, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,199

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604823

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—156 **8 Claims**



1. Cutting apparatus for steel rod comprising a feed track for conveying rods to be cut, said feed track having an output end, a discharge track aligned with said feed track and for receiving rods from the feed track, said discharge track having an input end spaced from said output end of said feed track, a series of selectively raisable and lowerable stops associated with said discharge track for positioning the leading end of a rod to be cut by raising of a selected one of said stops, a movable shear unit located between said output end of said feed track and said input end of said discharge track, means for adjusting the position of said shear unit relative to said output and input ends respectively to alter the position of operation of said unit and an intermediate track section between the shear unit and the input end of the discharge track said intermediate section being adjustable in length to accommodate changes in position of the shear unit.

4,102,229

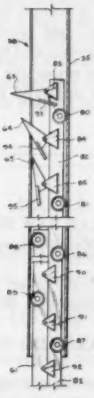
SAWMILL LOG TURNING APPARATUS

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Division of Ser. No. 470,338, May 16, 1974. This application Dec. 1, 1976, Ser. No. 746,519

Int. Cl.[2] B27B *31/04*

U.S. Cl. 83—712 **3 Claims**



1. As a subcombination,

an elongate support member having a generally flat edge surface adjacent each end,

a first pair of bracket members fixed to one end of said support member and extending laterally therefrom across the flat edge surface adjacent said one end thereof,

a second pair of bracket members fixed to the other end of said support member and also extending laterally therefrom across the flat edge surface adjacent said other end thereof, and

a generally triangular weighted engaging member pivotally interconnected between one of said pair of bracket members with one side thereof abuttable with the corresponding one of said flat edge surfaces of said support member for limiting rotation of said engaging member between said one pair of brackets.

4,102,230

SOUND-DEADENING DEVICE FOR ROTARY SAW BLADES

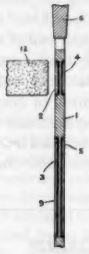
Erik Börje Magnusson, and Erik Inge Bertil Karlsson, both of Hallsberg, Sweden, assignors to Imk Industriservice AB, Hallsberg, Sweden

Filed Oct. 12, 1976, Ser. No. 731,779

Claims priority, application Sweden, Oct. 16, 1975, 7511590

Int. Cl.[2] B27B *33/08*

U.S. Cl. 83—835 **2 Claims**



1. In a rotary saw blade having a cutting periphery and having a center hole for mounting on a drive shaft, said rotary saw blade having a first side surface and a second side surface defining therebetween the cutting periphery, wherein the improvement comprises: at least one annular recess formed on each of said first and second side surfaces, each of said recesses being filled with a first layer of a melted binding metal in order to increase adhesion and a second layer of one of a melted metal and a melted alloy, said second layer being situated outside of said first layer so that said second layer is flush with the outside portion of the respective side surface, wherein a sound-deadening effect is achieved in the rotary saw blade when it is in use.

4,102,231

CIRCULAR SAW BLADES

Leopold Jägers, Rudolf-Diesel-Strasse 1, D-5350 Euskirchen, Germany

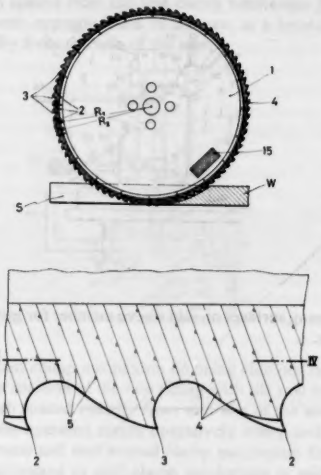
Filed Feb. 17, 1977, Ser. No. 769,713

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606598

Int. Cl.[2] B23D *61/02*

U.S. Cl. 83—854 **6 Claims**

1. A circular saw blade for sawing cold steel and the like, comprising a main blade portion (1, 8) with a number of leader teeth (2) and follower teeth (3) alternating on its periphery, wherein in the region of each of said teeth said blade portion is provided on both lateral surfaces with at least two lateral



cutting edges (4), said cutting edges extending from said teeth radially inwards.

4,102,232

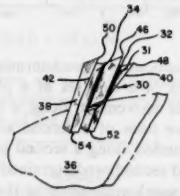
SAW TOOTH INSERT

Kenneth M. Cage, Marysville, and C. Warren Turner, Redmond, both of Wash., assignors to Black Clawson Inc., Everett, Wash.

Filed Mar. 2, 1977, Ser. No. 773,751

Int. Cl.[2] B27B *33/02, 33/08*

U.S. Cl. 83—854 **11 Claims**

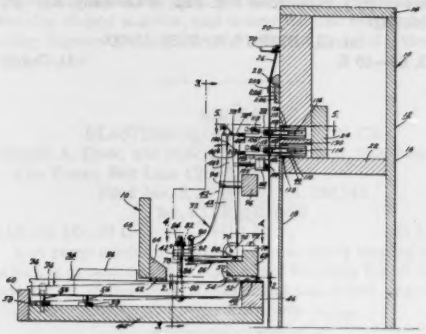


1. A saw tooth insert secured to a saw plate having an uninterrupted outer edge portion defining a surface of revolution for cutting wood or the like, said saw tooth insert having a front cutting face containing two adjacent grooves extending along the cutting face substantially radially outward from the rotational axis of said saw plate, with lower portions of said grooves ending on opposite sides of said saw plate, and upper portions of said grooves forming a central cutting edge between them such that a chip of material being sawed will be split in two with a portion being directed by each said groove along each side of said saw plate toward said axis, said insert further having a U-shaped opening formed in the lower central portion of the insert forming lower leg portions on said insert of equal width such that they can be disposed on opposite sides of said saw plate for securing said insert thereto and forming a saddle-shaped portion configured to mate with the outer peripheral edge portion of said saw plate.

4,102,233
UPRIGHT HARPSICHORD ACTION

Evan J. Kern, 434 W. Main St., Kutztown, Pa. 19530

Filed Jul. 7, 1977, Ser. No. 813,439
Int. Cl.[2] G10C *1/06*
U.S. Cl. 84—258 18 Claims



1. A harpsichord action comprising a frame assembly, a string supported vertically in tension by said frame assembly, a key disposed substantially horizontally and hingedly attached at its rear end to said frame assembly at a point in front of said string, a jack lever disposed above said key in vertical alignment therewith and pivotally attached to said frame assembly, said string being disposed in substantial alignment with said key and jack lever and extending from a point above and behind said jack lever and key to a point therebelow, a jack connected to said jack lever, a jack guide behind said string adapted to support said jack for sliding movement toward and away from said string, said jack having a plectrum adapted to engage and pluck said string, the depression of said key producing a rotation of said jack lever and a movement of said jack and plectrum toward said string to produce a plucking of said string.

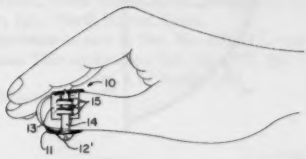
7. An upright harpsichord comprising a frame assembly, a keyboard comprising a plurality of keys each hingedly mounted at the inner end thereof to said frame assembly, a plurality of jack levers pivotally attached to said frame assembly, each said jack lever being disposed above an underlying key in vertical planar alignment therewith, means connecting each said key to the corresponding aligned jack lever whereby depression of each said key produces rotary movement of the corresponding jack lever, said frame assembly including string support means for supporting a substantially vertical array of parallel strings in tension, said strings each extending from a point above and behind said jack levers and keys to a point therebelow, at least one string being disposed in substantial alignment with each said key and jack lever, a jack guide extending horizontally behind said array of strings, each said jack lever having a jack connected thereto and supported by said jack guide for sliding movement toward and away from the string aligned therewith, each said jack including a plectrum adapted to engage and pluck said aligned string, the selective depression of the keys producing a rotation of the corresponding jack levers and a sliding movement of the jacks connected thereto to provide a selective plucking of the strings.

4,102,234
PICK HARNESS

Walter G. Brundage, 27 Haberem Ave., Unionville, Conn. 06085

Filed Mar. 30, 1977, Ser. No. 783,076
Int. Cl.[2] G10D *3/16*
U.S. Cl. 84—322 5 Claims

1. In combination with a conventional guitar pick having flat sides and a generally triangular configuration, a harness for securing the pick in normal playing position on the thumb of a player, said harness comprising a thin strap of flexible resilient material having a flat central portion overlying a flat side of the pick and provided with triangularly related slits receiving and securing the apices of the pick and having strap ends extending from opposite edges of the central portion with one of the strap ends extending generally perpendicularly to one of the slits,

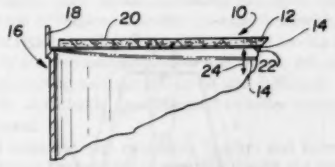


and means for adjustably securing the strap ends together about the thumb of a player with the flat central portion of the strap holding a flat side of the pick against the underside of a player's thumb with an apex of the pick projecting through said one of the slits tangentially to the underside of the player's thumb.

4,102,235
DRUM PRACTICE PAD

Laurence G. Le Masters, 12 Monmouth Pl., Huntington Station, N.Y. 11746

Filed Aug. 19, 1976, Ser. No. 716,014
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 R 2 Claims



1. In combination a drum and a drum practice pad of the type fabricated of a construction material having sound-muffling characteristics and used in a directly supported position on the playing head of said drum, said pad comprising a flexible, oil-tanned leather in a flat disc-like shape sized to cover said supporting drum playing head, to thereby contribute by its weight both to a reduction in the vibratory motion of the drum playing head and to minimize any shifting movements of said pad relative to said drum playing head.

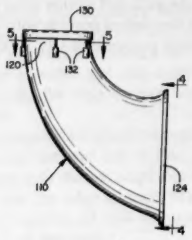
4,102,236
MOLDED CURVED DRUMS AND MOLDS THEREFOR

Roger W. North, 1332 SE. 16th, Portland, Oreg. 97214

Filed Oct. 18, 1976, Ser. No. 733,271
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 R 5 Claims

1. A molded drum shell curved through a substantial angle in the order of 90° and having a head end and a trumpet end, the end being circular in transverse cross-section and having a predetermined diameter,

the trumpet end having a minimum transverse dimension substantially larger than said predetermined diameter,



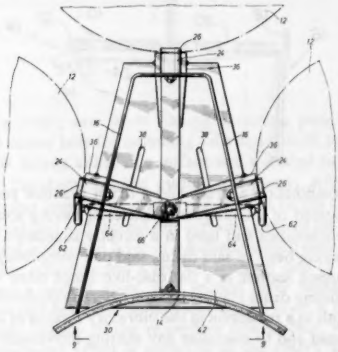
the shell tapering from circular at the head end to generally elliptical proceeding from the head end toward the trumpet end.

4,102,237

STAND FOR AN ASSEMBLY OF MUSICAL DRUMS

Richard R. Suess, 7245 Fairbanks-N. Houston Rd., Houston, Tex. 77040, and Frank A. Suess, San Antonio, Tex., assignors to Richard R. Suess, Houston, Tex.

Filed Mar. 3, 1977, Ser. No. 773,903
Int. Cl.² G10D *13/02*
U.S. Cl. 84—421 **10 Claims**



1. A stand for supporting an assembly of musical drums, said assembly adapted to be carried by a marching bandsman and including a plurality of percussive drums and a carrier commonly supporting the drums around a perimeter thereof, the carrier having a plurality of connectors extending outwardly for securing each of the drums, the stand comprising:

a basin defining structure for receiving said carrier, said basin defining structure including a base plate and a plurality of upstanding members which define a plurality of basin slots for receiving respective ones of said connectors, said upstanding members being movably securable to the base plate for accommodating carriers of different sizes and configurating; and

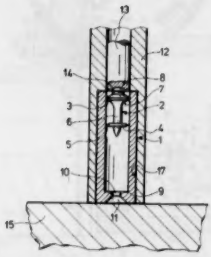
a base coupled to and vertically supporting the basin defining structure.

4,102,238

ANCHORING ASSEMBLY FASTENABLE BY AN EXPLOSIVE POWDER DRIVEN SETTING TOOL

Elmar Thurner, Altenstadt, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 21, 1977, Ser. No. 789,524
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617509
Int. Cl.² B23P *19/00*; F16B *15/00*
U.S. Cl. 85—10 E **11 Claims**



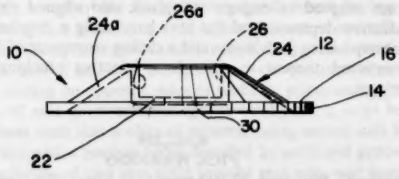
1. Anchoring assembly, in particular for use in a composite concrete and structural steel beam, comprising an axially extending cylindrical container-shaped member having a closed end and an open end spaced apart in the axial direction thereof and an axially elongated bore extending between the ends, a fastening stud positioned within the bore in said member and being partially displaceable therefrom by means of an explosive powder actuated fastening element setting tool applied to the open end of said member, said fastening stud comprising an axially elongated shank having a first end closer to the closed end of the bore and a second end closer to the open end of the bore and a head located at the second end of said shank and extending transversely outwardly therefrom, the closed end of said member having an opening therethrough spaced radially inwardly from the surface of the bore so that at least an axially extending portion of said shank of said fastening stud can be driven therethrough into a receiving material, wherein the improvement comprises that said fastening stud has an axial length considerably less than the axial length of the bore in the sleeve and is positioned in said bore with the first end of said shank spaced axially in the direction of said open end from the closed end thereof for being displaced toward the closed end by the setting tool.

4,102,239

WASHER

Charles M. Dallas, 1269 N. Pierce Ave., North Bellmore, N.Y. 11710

Filed Feb. 17, 1977, Ser. No. 769,446
Int. Cl.² F16B *43/00*
U.S. Cl. 85—50 R **4 Claims**



1. A washer assembly, comprising a first outer portion in the form of a hollow truncated right angle cone, the apex of said cone defining a first aperture, the widest end of said cone fixedly secured to a first flat disc shaped member having a first central opening, said widest end located at the marginal edges defining said first central opening, a second element adapted to

be seated in said cone and including a second flat disc shaped member having a second central opening therein, said first aperture residing in a plane parallel to said first disc shaped member, a cylindrically shaped tubular member having one end thereof fixedly secured to the marginal edges of said cone defining said aperture, the other end of said tubular member fixedly secured to the outermost marginal edges of said second flat disc shaped member, said second flat disc shaped member being disposed intermediate said apex end and said widest end of said cone.

4,102,240

BLASTING SLURRY PUMP TRUCK

Merrill A. Cook, and Robert B. Clay, both of 2026 Beneficial Life Tower, Salt Lake City, Utah 84111

Filed Jan. 3, 1977, Ser. No. 756,242
Int. Cl.[2] C06D *1/08*
U.S. Cl. 86—20 C 21 Claims

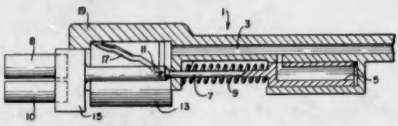
1. A pump truck for handling aqueous slurry blasting agents which is provided with a compressed air drive for all liquids and which is free from augers, electrical drives, ingredient flow drive motors, and hydraulic drives.

4,102,241

HIGH-RATE-OF-FIRE RIFLE MECHANISM OR DUAL CYCLIC RATE MECHANISM

Robert F. Magardo, Harford County, Md.; Leonard R. Ambrosini, Scott County, Iowa, and Raymond S. Isenson, Santa Barbara County, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 423,043, Dec. 7, 1973, abandoned. This application Oct. 26, 1976, Ser. No. 735,238
Int. Cl.[2] F41D *9/06*
U.S. Cl. 89—155 1 Claim



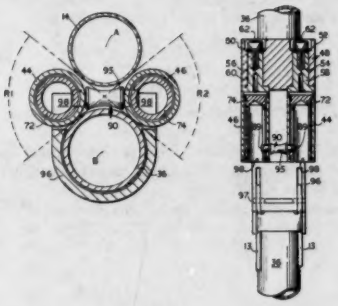
1. A high-rate-of-fire rifle mechanism comprising:
a single barrel;
a gas chamber;
a passageway between said gas chamber and said single barrel;
an operating rod having one end in communication with said gas chamber and a rammer integrally formed at its other end;
a return spring surrounding a portion of said operating rod;
a rotary cylindrical drum having three chambers, each chamber holding one round of ammunition for serial indexing in a firing position along said single barrel;
a trigger mechanism;
a cam path formed on the surface of said rotary cylindrical drum, whereby movement of said operating rod and follower effect rotation of said cylindrical drum;
a follower secured to said operating rod, said follower riding in said cam path;
means to provide three rounds of ammunition at a time for loading a round into each of said three chambers;
said cam path, said follower, said operating rod, said gas chamber, said cylindrical drum and said rammer effecting the firing of each of said three rounds in said three chambers in succession as a single burst, and loading of three new rounds in said three chambers while ejecting the said three fired rounds each time said trigger mechanism is activated, said operating rod making only one traverse rearward and back to its rest position each time three rounds of ammunition are fired and said follower making only one traverse of said cam path each time three rounds of ammunition are fired.

4,102,242

AUTOLOADING GAS-OPERATED FIREARM

Carl F. Liedke, North Haven, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.

Continuation-in-part of Ser. No. 601,627, Aug. 4, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,041
Int. Cl.[2] F41D *5/04*
U.S. Cl. 89—191 R 9 Claims



5. A gas-power system for a gas-operated autoloading shotgun having a receiver, a barrel removably mounted on said receiver and a tubular magazine mounted on said receiver under, parallel to, and spaced from, said barrel, said gas-power system comprising
a pair of gas cylinders symmetrically disposed relative to said barrel, each of said cylinders having a cylindrical extension of reduced diameter co-axial therewith,
a bracket rigidly mounted on said barrel and having a pair of open bores disposed parallel to said barrel, for receiving and supporting said extensions on said cylinders,
means for detachably securing said cylinder extensions in said bores,
gas-port means in said extension, bracket and barrel interconnecting the interior of said barrel with the interior of each of said cylinders,
a piston mounted for reciprocal movement within each of said cylinders, and
means for limiting such reciprocal movement of each of said pistons within its cylinder.

4,102,243

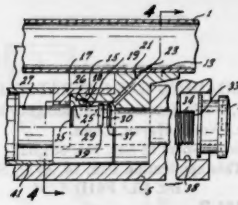
GAS REGULATOR FOR GAS OPERATED FIREARMS

Fred LeRoy Jennie, Anaheim, Calif., assignor to Weatherby, Inc., South Gate, Calif.

Continuation-in-part of Ser. No. 710,216, Jul. 30, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 726,939
Int. Cl.[2] F41D *5/08*
U.S. Cl. 89—193 1 Claim

1. In a gas operated firearm having a gas operated piston for operating the action of the firearm, there being channel means for conveying gas from the barrel of the firearm to the piston means, the improvement comprising a metering device positioned for regulating a flow of gas through the channel means to the piston means, the metering device including cylinder means having an adjustable member positioned to restrict the flow of gasses between the metering device and the bore of the

cylinder means, the adjustable member being a metering plug positioned in the bore of the cylinder means, the said metering

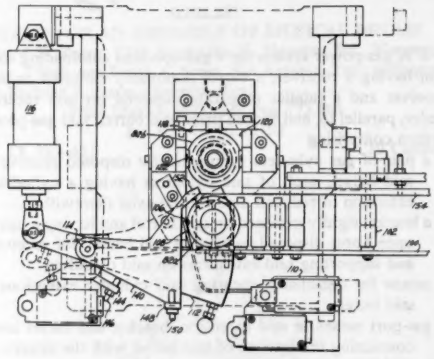


plug having an annular rib, and said metering plug being reversible within the bore of the cylinder means.

4,102,244
POT BROACH

Eugene J. Bistrick; Axel B. Abrahamsson, both of Warren; Andrew J. Szewczyk, Harper Woods; Frank A. McCabe, Detroit; Richard A. Schlaf, Sterling Heights, and Leonard A. Gabriele, Warren, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 734,301, Oct. 20, 1976, Pat. No. 4,065,222. This application Jun. 27, 1977, Ser. No. 810,307
Int. Cl.² B23F *1/00, 9/04;* B23D *41/06*
U.S. Cl. 90—1 **10 Claims**

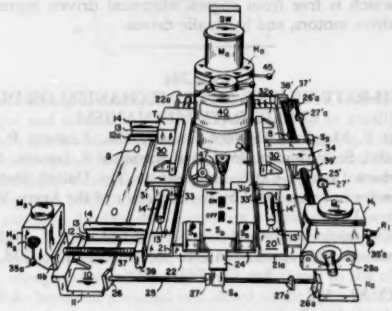


1. A vertical pull-up pot broaching machine, comprising a rigid frame, a generally tubular pot broach mounted in a fixed position on said frame, said pot broach comprising a longitudinally segmental rigid tubular support body, a first series of flat-sided, abutting, internally toothed cutting rings, each ring having a multiplicity of cutting teeth in a single circumferentially extending array, a second series of flat-sided, abutting, locating and support rings, said second series of rings having internally open, radially extending, circumferentially spaced slots, flat-sided elongated sticks received in said slots, said sticks having progressively stepped cutting teeth adapted to remove material from the bottoms of tooth spaces but by the cutting teeth of said first series of rings, a slide on said frame above said pot broach, a drawbar detachably connected to said slide to be pulled vertically upwardly thereby through said pot broach, a work supporting seat adjacent the lower end of said drawbar, a retriever mounted on said frame below said pot broach for vertical movement thereon, means for moving said slide and retriever independently, an automatic loader comprising a locator having a horizontal support surface having a portion shaped to receive the foremost of a series of work blanks and a locating portion having a central opening to receive said drawbar and having a plurality of vertically extending guides to engage the periphery of a work blank to locate it in vertical alignment with said pot broach and to guide it during initial vertical movement thereof, a first pusher movable laterally into engagement with the foremost of a series of work blanks movable toward said locator, said pusher having a portion shaped to retain the series of blanks against advance as the leading blank is moved laterally onto the locating portion of said support surface, an unloader above the upper end of said pot broach comprising resilient means to engage and retain a finished gear in position as said drawbar is moved downwardly by said retriever, and a second pusher movable laterally of the finished gear to move it away from said resilient means toward a discharge chute.

4,102,245
DOOR FRAME TRUING APPARATUS

James R. Cousins, Washington, Pa., assignor to Hallmor, Inc., Bethel Park, Pa.

Filed Apr. 28, 1976, Ser. No. 681,024
Int. Cl.² B23C *1/20, 9/00*
U.S. Cl. 90—12 R **5 Claims**



1. In a portable machine for truing a continuous door sealing flange of a high temperature furnace or oven, a substantially rectangular base support frame having a pair of transversely spaced-apart substantially parallel longitudinal side members and a first pair of spaced-apart parallel rail members connected across said pair of side members and defining an open central portion therewith, means for removably securing said base support frame in position with respect to the flange being trued, a movable secondary frame having a pair of transversely spaced-apart substantially parallel longitudinal side members and a pair of spaced-apart parallel transverse end members connected across said pair of side members and defining an open central portion therewith, said secondary frame having rail-engaging means for moving it for back and forth movement along said first pair of rail members transversely across said base support frame, a second pair of spaced-apart parallel rail members mounted to extend longitudinally along said pair of longitudinal side members of said secondary frame, an overhead tertiary frame having a pair of transversely spaced-apart parallel longitudinally extending side members and having rail-engaging means for mounting said tertiary frame for back and forth movement along said second pair of rails with respect to said secondary frame in a substantially right angular direction with respect to movement of said secondary frame along said base support frame, said tertiary frame defining an open central portion, motor-driven milling means operatively carried by said tertiary frame and having a truing head extending therefrom through the open central portions of said tertiary and secondary and base support frames for engagement with and movement along the door sealing flange as effected by movements of said tertiary and secondary frames with respect to said base support frame and each other, first motor means mounted on one longitudinal side member of said base support frame, a first screw shaft at one end operatively connected to said first motor means and extending therefrom transversely of

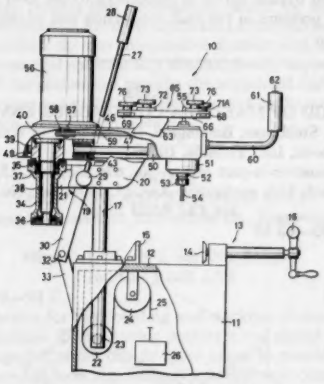
said base support frame, a first screw block carried by one longitudinal side member of said secondary frame and receiving a forward end portion of said first screw shaft therein for moving said secondary frame transversely back and forth along said first pair of rails with respect to said base support frame, a second motor means mounted adjacent one end of and on the other longitudinal side member of said pair of said secondary frame, a second screw shaft at one end operatively connected to said second motor means and extending forwardly therefrom longitudinally of said secondary and tertiary frames, a second screw block carried by one longitudinal side member of said tertiary frame and receiving a forward end portion of said second screw shaft therein for moving said tertiary frame longitudinally back and forth with respect to said secondary frame, electrical control means for automatically progressively actuating said first and second motor means forwardly and then backwardly to, in sequence, forwardly advance said secondary and tertiary frames and to, in sequence, backwardly retract them to move said truing head in a full cycle continuous encircling path along the door sealing flange, said control means having switch means for automatically stopping movement of said secondary and tertiary frames on completion of the full cycle path of movement, and said control means having manual means for stopping the automatic progression of said frames at any selected position of their movements and for then thereat reinitiating their automatic progression to continue the truing operation.

4,102,246

HAND-OPERATED PROFILING MACHINE

Taiichi Okamoto, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,596
Claims priority, application Japan, Jul. 5, 1976, 51-80064
Int. Cl.² B23C *1/16*
U.S. Cl. 90—13.2 **9 Claims**



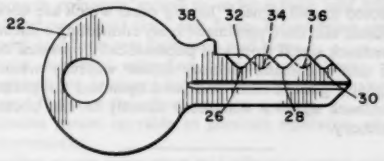
1. A hand-operated profiling machine comprising;
(a) a table;
(b) a support mounted on and being movable toward and away from said table, said support having a shaft extending substantially perpendicularly to said table;
(c) a head supported on said support and having means for holding a cutter, said head being pivotable about and movable toward and away from said shaft; and
(d) guide means mounted on said support, said head being confined in motion relative to said shaft by said guide means.

4,102,247

DEPTH KEY SET

Victor Vincent Fanberg, 5221 Mt. Ariane Ter., San Diego, Calif. 92111

Filed Oct. 4, 1976, Ser. No. 729,347
Int. Cl.² B23Q *35/42*
U.S. Cl. 90—62 R **3 Claims**



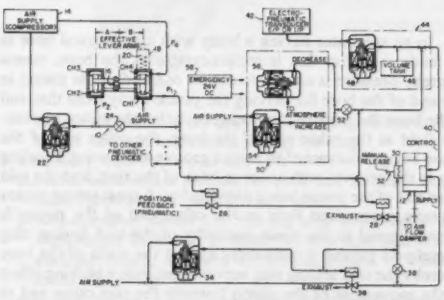
1. A set of master keys comprising:
a pair of keys for each desired cut depth,
a first key in each of said pairs having cuts at the odd numbered longitudinal cut positions,
and a second key in each of said pairs having cuts at even numbered cut positions.

4,102,248

PROTECTIVE SYSTEM FOR PNEUMATICALLY OPERATED DEVICES

Lyle F. Martz, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 665,134
Int. Cl.² F15B *15/26*
U.S. Cl. 91—42 **1 Claim**



1. A protective system for immobilizing a pneumatically operated device in the event of loss of air supply comprising:
means for sensing the air supply providing a signal P which is a function of the magnitude of pressure of said air supply;
means for braking said pneumatically operated device, having an air chamber said braking means being inactivated by the presence of air pressure;
a needle valve;
first and second pneumatically operated relays, each having an operating chamber, the operating chamber of said first relay being connected to said sensing means to receive said signal P which keeps said first relay normally closed, said first relay being connected to said air chamber and to the operating chamber of said second relay said second relay being normally open and connected to said air chamber through said needle valve, and to said air supply, whereby when the air supply fails said signal P goes to zero causing said first relay to open to atmosphere exhausting said air chamber in the operating chamber of said second relay which thereby closes thus actuating the brake means and disconnecting the air supply;

an electropneumatic transducer means for sending a pneumatic control signal;

a solenoid valve connected in series with said electropneumatic transducer means;

a pneumatic memory means interposed between said solenoid valve and said pneumatically operated device for maintaining an air pressure which is a function of the displacement of said pneumatically operated device; and

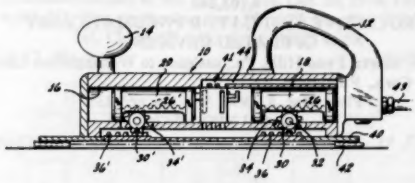
a third pneumatic relay having an operating chamber connected to said signal P having ports which are normally closed, said third pneumatic relay connecting a pneumatic feedback signal from said pneumatically operated device to said pneumatic memory means whereby when said signal P goes to zero, said ports open and the pneumatic feedback signal is connected directly to said pneumatic memory.

4,102,249

PNEUMATICALLY DRIVEN DEVICES

Burton M. Berniker, 6524 Whitaker Ave., Van Nuys, Calif. 91406

Filed Aug. 18, 1976, Ser. No. 715,426
Int. Cl.[2] F01B *9/00*; F15B *15/26*
U.S. Cl. 91—186 **10 Claims**



1. In an apparatus having a body with a cylindrical bore in the body, a piston that is reciprocatable in the bore, means whereby pressure is caused to act on one end of the piston in one end of the bore for driving the piston away from that end of the bore, the construction being such that the piston pressurizes fluid at the other end of the bore, the other end of the piston being constructed to have a groove and having a sealing ring in the groove, with space in back of the ring, and the said other end of the piston being provided with passageway means whereby pressurized fluid at the other end of the piston is communicated to the space inwardly of the said sealing ring whereby to expand it outwardly against the walls of the bore whereby the said sealing ring serves to provide a braking effect on the movement of the piston towards the said other end of the bore.

4,102,250

LOAD CHECK AND BYPASS VALVE

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

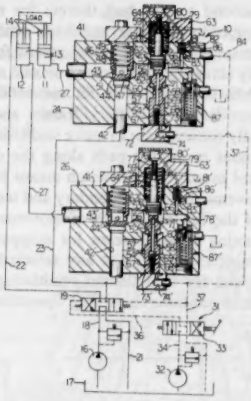
Filed Aug. 16, 1976, Ser. No. 714,448
Int. Cl.[2] F15B *11/00, 13/00*
U.S. Cl. 91—412 **13 Claims**

1. In a hydraulic load lifting system including a source of fluid supply, a pair of hydraulic lift motors each having a load supporting end, a pair of load check valves individually connected to the load supporting means of the motors, each of the check valves being connected to the source of fluid supply for providing substantially unrestricted fluid flow therethrough from the source of fluid supply to the load supporting ends of the motors while blocking reverse fluid flow therethrough, the improvement comprising:

a pair of bypass valves connected to the source of supply and individually connected to the load supporting ends of the motors for controlling the flow of fluid exhausted from the load supporting ends of the motors to the source of fluid supply, each of the bypass valves being movable between an opened position at which fluid is free to flow therethrough from the load supporting end of the respective motor to the source of fluid supply and a closed position at which fluid flow therethrough is blocked;

first means responsive to the load generated fluid pressure in the load supporting end of the motors for exerting a valve opening force on the respective bypass valve;

second means responsive to the load generated fluid pressure in the load supporting end of one of the motors for exerting a valve closing force on the associated one of the bypass valves;



third means responsive to the load generated fluid pressure in the load supporting end of the other of the motors for exerting a valve closing force on the other of the bypass valves; and

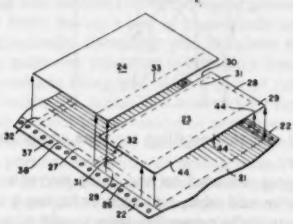
fourth means connecting the second means to the third means for communicating the load generated fluid pressure in the load supporting end of said one motor to said third means so that the valve closing force exerted on both of said bypass valves is responsive to the load generated fluid pressure in the load supporting end of said one motor.

4,102,251

METHOD OF MAKING A CONTINUOUS ENVELOPE

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 696,353, Jun. 15, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,228
Int. Cl.[2] B31B *27/60*
U.S. Cl. 93—63 M **6 Claims**



1. A method of continuous envelope structure manufacture comprising the steps of

advancing a continuous web along a predetermined path,

uniting thereto a plurality of ply segments to form a continuous ply, each ply segment having a bottom edge and a top

edge extending transversely of the length of said continuous ply with the top edge being free of union with said continuous ply to provide an envelope flap, said ply segments being positioned relative to said continuous ply incident to union thereof to overlap the top edge of one segment relative to the bottom edge of an adjacent segment,

simultaneously perforating the united ply segments and continuous web along a transverse line adjacent each segment bottom edge to develop lines of potential severance in said continuous web, and

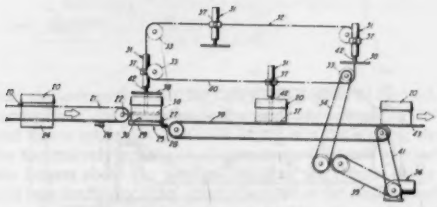
zig-zag folding the united ply segments and continuous web along said transverse lines.

4,102,252

CONTINUOUS MOTION APPARATUS AND METHOD FOR SEALING CARTONS

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Filed Mar. 25, 1977, Ser. No. 781,157
Int. Cl.[2] B31B *1/64*
U.S. Cl. 93—36.3 **16 Claims**



14. A continuous motion method of sealing the bottom flaps of cartons as the cartons are delivered in a regular succession from a high speed carton erecting machine comprising the steps of briefly interrupting the movement of each carton to square it in relation to its line of travel and folding and closing the bottom flaps of the carton while it is briefly interrupted, releasing the carton and engaging it with a continuous motion endless path bottom flap compression device by introducing such device through the open top of the carton and moving the device downwardly into compressive contact with the bottom of the carton, and substantially simultaneously supporting the bottom of the carton and moving the supported carton in the same direction and at the same speed as said continuous motion endless path compression device.

4,102,253

COUNTING AND STACKING UNIT

David James H. Gannicott, 22 Nuffield Dr., Scarborough, Canada

Filed Oct. 26, 1976, Ser. No. 735,688
Int. Cl.[2] B31B *1/98*
U.S. Cl. 93—93 C **14 Claims**

1. Apparatus for the counting and stacking of sets of forms such as business forms, having a plurality of sheets of paper, bonded together along one or more edges to provide a form set, said bonded form sets being supplied to said counting and stacking apparatus, said counting and stacking apparatus comprising;

main conveyor means for receiving said business forms and moving the same along a predetermined main path;

first and second branch conveyor means communicating with said main conveyor means, for moving said forms along either a first or a second branch delivery path;

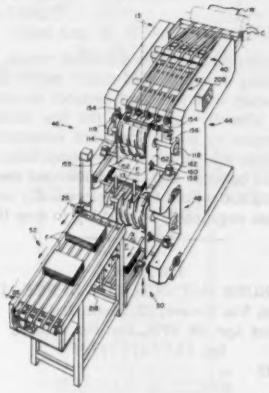
selectively operable diverting gate means for diverting form sets to one of said first or said second branch paths selectively;

first and second stacking means, communicating with said first and second branch conveyor means, said first and second stacking means being adapted to receive form sets from their respective said conveyor means, and assemble the same into stacks of form sets, said first and second stacking means being located one above the other, at predetermined first and second levels and wherein each of said stacking means comprises rotary stacking members having a plurality of fingers, defining generally open-ended slots, said fingers being mounted for rotation on a spindle, and being oriented in relation to a said respective branch conveyor means to receive form sets delivered therefrom in said slots, said finger means being rotatable with said form sets located in said slots;

ejector members extending between said finger means, whereby to intercept form sets carried in said slots, and eject the same therefrom, to form a stack;

vibration means operable to generate repetative vibration movements;

coupling means connecting said vibration means with said ejector members, whereby to vibrate said ejector members to and fro, thereby applying a jogging action to form sets at said stacking means during stacking;



a delivery table located at said first level;

movable hoist means located between said first and second stacking means and said delivery table;

power-operated means for moving said hoist means into registration with one or other of said first and second stacking means, whereby to receive a stack of business forms therefrom;

conveyor means on said hoist means, intermittently operable to receive a stack of forms from a said stacking means, and subsequently to transfer such stack from said hoist means onto said delivery table, and,

counting means for counting form sets moving along said first or second branch conveyor means respectively, and connected with said gate means for operating the same to switch delivery of form sets from one of said first or second branch conveyor means to the other, when a predetermined count of form sets has been recorded on said counting means.

4,102,254

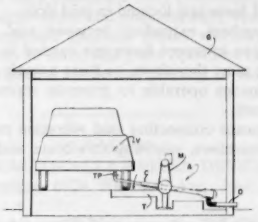
EXHAUST DISPOSAL SYSTEM

James L. Grant, 353 Tompkins Ave., Brooklyn, N.Y. 11216

Filed Jan. 4, 1977, Ser. No. 756,914
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 R **8 Claims**

1. An exhaust system for a vehicle or the like, including conduit means, said conduit means being movable from an inoperative position to an operative position, with said inoperative position being defined with one end of said conduit means being out of contact with an exhaust outlet and with said

operative position being defined with said one end being in communication with said exhaust outlet, respectively, means moving said conduit means between said two positions, blower means associated with the other end of said conduit means for conducting exhaust fumes from said exhaust outlet therethrough and into the atmosphere, said moving means comprising a support, motor means mounted thereon, said motor means being driven from a source of electric power, switch means energizing said motor means, lifting means disposed



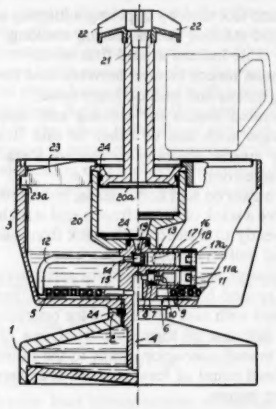
between said motor means and said conduit means, including a first member being driven by said motor means and being in driving relationship with a second member mounted on said conduit means whereby rotation of the first member causes said conduit means to move from said inoperative to said operative position, said lifting means comprising an endless member disposed between said first and second members having a lug thereon and a limit switch electrically connected to said motor means engageable by said lug to stop the motor.

4,102,255

HIGH PRESSURE HOUSEHOLD COFFEE MACHINE

Luigi Gasparrini, Via Timavo, 22, Rome, Italy

Filed Apr. 19, 1976, Ser. No. 678,283
Int. Cl.[2] A47J *31/24*
U.S. Cl. 99—303 **6 Claims**



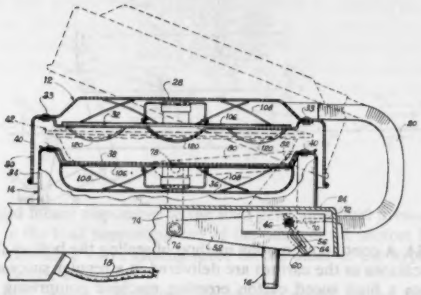
1. A machine for preparing "espresso" coffee, particularly for use as a home appliance, including a container for the water to be heated and intended to form the coffee drink, a percolation chamber above said water container and including a layer of powdered coffee through which the heated water is caused to percolate under pressure a delivery conduit connected to said percolation chamber to receive and direct said heated water to a container, a pipe extending between said percolation chamber and said water container having one end submerged in the water contained in said water container and another end opening into the bottom of said percolation chamber, a valve in communication with said pipe between said another end and said percolation chamber, and a cooling space surrounding a portion, of said pipe wherein said cooling space is located above said water container and contains a cooling fluid separated from the water in said water container, said cooling space and fluid providing a controlled cooling of said hot water passing in said pipe to cause activation of said coffee charge in said percolation chamber without burning same the machine further comprising a partition wall arranged between said cooling space and said water container for limiting the heat transfer therebetween.

4,102,256

COOKING APPARATUS

Raymond John, Carpentersville; Jerome G. Apfelbaum, Arlington Heights, and Robert L. Moore, LaGrange, all of Ill., assignors to Engineering Inventions Inc., LaGrange and Multisensors Inc., Chicago, both of, Ill.

Continuation of Ser. No. 292,479, Sep. 27, 1972, abandoned. This application May 17, 1976, Ser. No. 687,099
Int. Cl.[2] A47J *37/06*
U.S. Cl. 99—372 **16 Claims**



1. A cooking apparatus for food comprising a support for the food, said support comprising upper and lower housings having facing inner walls for receiving said food therebetween, at least one of said walls comprising a thin-walled flexible member of low heat retaining capacity defining the cooking surface, said flexible member having its ends fixed relative to said housing, thin flexible heating means positioned against one side of the thin-walled flexible member, said thin-walled flexible member and said heating means comprising separate members subject to relative movement and thereby being subject to warpage relative to each other due to thermal stress, mounting means comprising means for maintaining said heating means in position against said thin-walled flexible member to achieve continued intimate association thereof, means for electrically insulating said heating means from said thin-walled flexible member, said maintaining means including resilient means located for engagement with said heating means at a plurality of spaced-apart points over substantially the entire extent of said heating means for thereby applying forces substantially completely over the extent of said heating means, and means thermally insulating said heating means from the portions of said support other than said thin-walled flexible member whereby the food serves as the primary heat sink for heat generated by said heating elements.

4,102,257

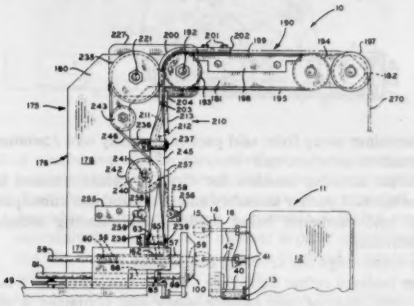
STUFFING APPARATUS

Clemente Del Ser Gonzalez, Pasco Talleres No. 36, Villaverde Alto, Madrid, Spain

Filed Feb. 14, 1977, Ser. No. 768,055
Int. Cl.[2] A23D *1/00*
U.S. Cl. 99—494 **15 Claims**

1. In a machine for inserting stuffing material into objects, each of which has a cavity communicating with the exterior

thereof through a mouth, wherein the machine has a stuffing station and is adapted to deliver said objects successively to the stuffing station with the mouths disposed in a common direction, the improvement comprising a dilating mechanism having a plurality of fingers movable to and from said cavities substantially equally spaced about an axis aligned with the stuffing station movable toward said axis to contracted positions adapted to be received by the cavities of successive objects positioned at the stuffing station and from said axis to dilate the cavities and defining a passage therebetween along



said axis; means for inserting said stuffing material through the mouths and into the cavities of objects at the stuffing station; and means operable while each object is at the stuffing station for successively moving the fingers toward the axis to constrict the fingers about the passage, inserting the fingers along the axis into the cavity of an object disposed at the stuffing station, spreading the fingers from the axis to dilate the cavity, inserting stuffing material through the passage into the cavity, retracting the fingers to retracted positions, and withdrawing the fingers from the cavity along said axis.

4,102,258

APPARATUS FOR INJECTING A LIQUID ADDITIVE INTO POULTRY FLESH

Eldon J. Strandine, Chicago, and Carl H. Koonz, Northbrook, both of Ill., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 493,686, Aug. 1, 1974, Pat. No. 4,008,338. This application Oct. 13, 1976, Ser. No. 732,114

Int. Cl.[2] A22C *21/00*

U.S. Cl. 99—532 **3 Claims**

1. An improved injection apparatus which is inserted by hand between the skin and flesh of a poultry carcass from the posterior end for injecting an additive material into the flesh thereof, said apparatus being connectable to a source of additive supply and wherein the improvement comprises: a single hollow slender manifold closed at one end and connectable at the other opposite end with the source of liquid additive supply, the closed end of the manifold being blunt and smooth and said manifold being of a length approximating the longitudal length of said carcass; a plurality of hollow tines rigidly connected and extending substantially perpendicular and comblike to said manifold, said tines being spaced along approximately two-thirds or less of said manifold from said closed end and along one side of said manifold with the tines and manifold being substantially co-planar, said tines having closed pointed ends; and orifices in said hollow tines, said tines communicating with the hollow interior of said manifold wherein liquid additive delivered to said manifold will discharge through said orifices.

4,102,259

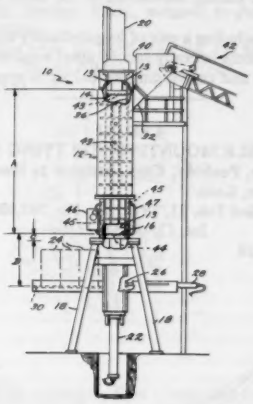
VERTICAL CLOSED CHAMBER BALER

Wallace M. Thompson, and William D. Beeland, both of Cordele, Ga., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Aug. 26, 1976, Ser. No. 717,872

Int. Cl.[2] B65B *13/20*

U.S. Cl. 100—3 **3 Claims**



1. A method of compressing particulate stringy combustible material comprising feeding a stream of the material along an inclined path and then through a side opening of a vertical chamber and onto a vertically movable gate ram which supports the material, closing the side opening when the upper surface of the material in the chamber reaches a predetermined level which is at least as high as the upper edge of the side opening, said closing step including moving a door horizontally across the side opening along a path which lies in the plane of the side opening so that in the closed position the door forms part of the wall of the chamber, the leading edge of the door being inclined with respect to the direction of travel and passing through a mass of the particulate material existing at the side opening and cooperating with a vertical anvil at the end of its travel in a manner to shear particulate material between the anvil and the door edge along a path which begins at one end of the anvil and travels along the anvil to its other end, moving a compression ram downwardly past the closed opening toward the gate ram while holding said gate ram stationary thereby compacting the material, applying straps to the compacted material while in the chamber to form a baled mass moving the compression ram and the gate ram downwardly until the baled mass has moved out of the chamber, moving the compression ram upwardly away from the baled mass, and moving an ejector ram horizontally to push the baled mass from the gate ram.

4,102,260
CANTILEVERED TYING NEEDLE CONSTRUCTION FOR CROP BALERS

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

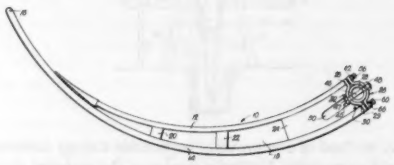
Filed Feb. 11, 1977, Ser. No. 767,981
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—24 9 Claims

1. A tying needle for crop balers comprising:
mounting means for attaching the needle to a movable support;
an elongated, generally planar frame extending outwardly from said mounting means and terminating in a remote tip,
said frame tapering within said plane as said tip is approached; and
means at said tip for retaining a strand of tying material with the needle during movement of the same with said support,
said frame including a pair of longitudinally extending structural members laterally spaced apart adjacent said mounting means and converging as said tip is approached.

4,102,261
ADJUSTABLE MOUNTING FOR TYING NEEDLES

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Feb. 11, 1977, Ser. No. 767,986
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—24 15 Claims



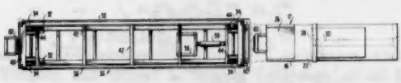
1. A cantilevered mounting for an elongated tying needle comprising:
a transverse support having an arcuate periphery:
structure at one end of the needle fastening the same tightly against said support with a predetermined amount of force; and
means for adjustably rotating the needle about said periphery while said predetermined amount of force remains applied whereby to vary the circumferential position of the opposite end of the needle with respect to the support.

4,102,262
APPARATUS FOR LOADING REFUSE INTO CONTAINERS

Harvey W. Liberman; Paul L. Goranson, both of Knoxville; R. Houston Ratledge, Jr., Maryville, and John C. Salyers, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,375
Int. Cl.[2] B30B *15/16*
U.S. Cl. 100—53 25 Claims

1. A refuse loading station comprising:
a refuse packer assembly;
a refuse container having a movable wall member and a vertically slidable closure;
a loading dock disposed in front of said packer assembly, said loading dock including a loading carriage and track means for supporting said carriage for limited movement toward and away from said packer assembly;
said carriage including means for removably supporting said container;
power actuable means on said loading dock for reciprocating said carriage to shift said container toward said packer assembly to a refuse loading position, and to shift said

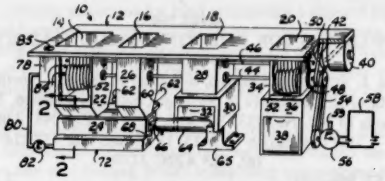


container away from said packer assembly to a container-removal position; and
a refuse clearing member for clearing refuse situated between said packer assembly and said container subsequent to said container being loaded, said clearing member including:
a cutter edge for severing refuse; and
an inclined refuse deflecting surface located under a bottom edge of said closure when said container is in a refuse loading position to deflect into said container refuse which is situated under said closure when said closure is lowered.

4,102,263
GARBAGE RECYCLING SYSTEM

Robin R. Forsberg, 898 McGlincy La., Campbell, Calif. 95008

Filed Aug. 3, 1977, Ser. No. 821,449
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—74 1 Claim

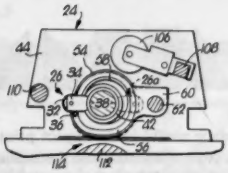


1. Apparatus for treating garbage, comprising:
a receptacle having an open bottom and having an open upper end forming a passageway for receiving and passing garbage;
shredder means including a motor driven shredder disposed transversely of the receptacle passageway for acting on garbage and reducing its bulk when garbage is placed within said receptacle;
container means including a mold having a cover for opening and closing the mold disposed below said receptacle for receiving garbage falling by gravity through said receptacle;
a ram operatively connected with said mold for compacting garbage therein;
a reservoir underlying said mold;
a liquid within said reservoir,
said mold and said reservoir having cooperating apertures formed in at least one wall providing liquid communication between said mold and said reservoir;
a pressure tank disposed adjacent said receptacle;
a plurality of nozzles providing liquid communication between said pressure tank and said receptacle; and,
pump and tubing means connecting said tank with said reservoir for spraying garbage deposited in said receptacle.

4,102,264
NUMBERING THROW-OFF FOR COLLATOR

Richard L. Sommers, and Fred H. Sickler, both of Emporia, Kans., assignors to Didde-Glaser, Inc., Emporia, Kans.

Filed Dec. 22, 1976, Ser. No. 753,528
Int. Cl.[2] B41L 45/00
U.S. Cl. 101—77 9 Claims



1. A numbering unit for successively numbering webs or the like in a predetermined sequence, said apparatus comprising:

at least one rotatable numbering machine mounted on a rotatable shaft and having a movable indexing arm for successively changing the number applied to said webs or the like during rotation of said machine and in accordance with said predetermined sequence;

a cam member having a groove therein for receiving said arm;

a pivotal shaft supporting said cam member and permitting shifting of the cam member between a first indexing position where said arm is successively moved for indexing said machine as the machine rotates and said arm travels within said groove, and a second position where said machine is not indexed during rotation thereof with said arm traveling within said groove; and

means for pivoting said pivotal shaft for shifting said cam member between said first and second positions, said pivoting means including

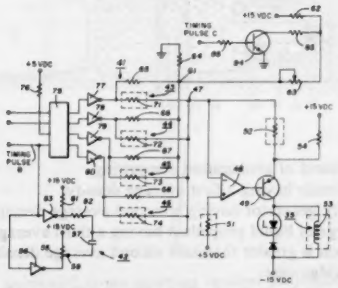
a plate coupled to said cam-supporting shaft and shiftable between respective positions corresponding to the first and second positions of said cam member;

operating means for pivoting said plate between said respective positions thereof for shifting of said cam member between said first and second positions.

4,102,265
HAMMER DRIVER CONTROLLER FOR IMPACT PRINTERS

David R. Deetz, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 622,582, Oct. 15, 1975, abandoned.
This application Feb. 11, 1977, Ser. No. 767,714
Int. Cl.[2] B41J 7/92
U.S. Cl. 101—93.03 4 Claims



1. In an impact printer having

a hammer for serially printing replicas of selected characters, belonging to different predetermined classes, on a recording medium in response to energizing current applied to an electromagnetic driver for said hammer, and

means for supplying a control signal to differentiate between said different classes of characters;

the improvement comprising a controller for supplying said energizing current for said hammer driver; said controller including

means for establishing different finite set point current levels to obtain a substantially uniform printing density for characters of said different classes,

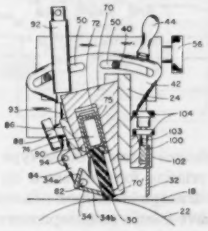
means for selecting an appropriate one of said set point levels in response to said control signal as a prelude to printing each of said selected characters, and

means for causing said current to decay from a high initial level toward the selected set point level during the printing of each of said selected characters, whereby an impulse force is applied to said hammer to aid in overcoming any static friction and a controlled impact energy is imparted to said hammer to achieve substantially uniform density in the printing of each of said selected characters.

4,102,266
SQUEEGEE, INK SCOOP AND FLOOD BLADE ASSEMBLY

Frank L. Porth, Morley, Mich., assignor to James A. Black, Kent City, Mich.

Filed Mar. 18, 1977, Ser. No. 778,867
Int. Cl.[2] B41F 15/44, 15/46
U.S. Cl. 101—124 4 Claims



1. A stencilling squeegee, flow coater and scoop assembly for cooperation with a stencil screen reciprocating in advance stencilling strokes and reverse return strokes, comprising:

an elongated squeegee mount and squeegee supported thereby;

a pair of spaced supports for said squeegee mount;

said squeegee mount and squeegee being vertically shiftable by said supports between a lowered stencilling position during the stencil screen advance stroke, and an elevated nonstencilling position during the stencil screen return stroke;

an elongated fluid scoop between said supports, parallel to and spaced from said squeegee;

said fluid scoop comprising a trough-type member positioned ahead of said squeegee relative to the screen advance, said fluid scoop being pivotally shiftable from a fluid dumping position, through a fluid scooping action approaching and sweeping adjacent the screen to scoop up excess fluid in front of said squeegee, to a fluid retention position, whereby excess fluid in front of the squeegee can be scooped up at the end of the stencilling stroke and retained during the return stroke, and said fluid scoop being shiftable from said fluid retention position back to said fluid dumping position whereby excess fluid can be dumped prior to lowering of said squeegee by said supports at the start of the stencilling stroke for use of the fluid during subsequent stencilling strokes; and a flow coater between said supports and behind said squeegee

relative to the screen advance to flow coat the fluid dumped from said scoop into a coating of fluid on the screen during the stencilling stroke as the squeegee preceding it performs the stencilling function.

4,102,267

FEEDING OF SHEETS AND CARDS IN A ROTARY DUPLICATOR MACHINE CAPABLE OF WHOLE-PAGE AND LINEWISE PRINTING

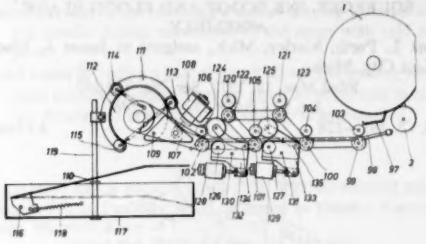
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,433

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618658

Int. Cl.² B41L *11/08*

U.S. Cl. 101—132.5 **10 Claims**



1. In a rotary duplicator machine of the type provided with a printing drum, a printing form mounted on the drum and bearing a transferrable image in the form of a text comprised of a plurality of successive lines, a conuterpressure element movable into and out of counterpressure engagement with the printing drum to effect transfer of the whole text, preselected individual lines or preselected groups of lines to sheet material transported between the printing drum and the counterpressure element, and infeed rollers located upstream of the image transfer location for feeding sheet material to the image transfer location, in combination, stacked-sheet feeding means operative for removing whole-page sheets onto which the entire text on the printing form is to be transferred from a stack of such sheets and feeding such whole-page sheets to the infeed rollers; card infeed transport means defining a card infeed transport path located beneath the stacked-sheet feeding means and operative for feeding cards to the infeed rollers; at least one stacked-card feeding means operative for removing cards of smaller format than the whole-page sheets and onto which only preselected parts of the text on the printing form are to be transferred from a stack of such cards and feeding such cards into the card infeed transport path, the at least one stacked-card feeding means comprising a respective container for a stack of such cards located to the side of the card infeed transport path and provided with means defining an exit slit from the container, the exit slit having about the thickness of one card, and a feeding knife for removing individual cards from the stack in the container and ejecting them from the container through the slit and into the card infeed transport path; and control means operative for detecting when an ejected card has in its entirety left the card container and entered the card infeed transport path and in response to such detection initiating transport operation of the card infeed transport means.

4,102,268

IMPACT PRINTER TYPE CHARACTER

Fernando V. Guarderas, Woodland Hills, and Luis Leon, Redondo Beach, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Jun. 30, 1975, Ser. No. 591,538

Int. Cl.² B41J *7/70*

U.S. Cl. 101—399 **2 Claims**

1. A type surface useful in an impact printer which moves type characters, from the leading to the trailing edges thereof, past a plurality of aligned hammers, each hammer being individually actuatable to impact against a selected type character to print an image of the selected character on a paper passed therebetween, said type surface including at least one type character thereon for printing a single element of a matrix character comprised of a plurality of such elements, said one type character comprising:

a plurality of land area portions each raised above said type surface;

said plurality of land area portions being spaced from one another and distributed within an area on said type surface so as to define a substantially rectangular periphery;

said plurality of land area portions being positioned within said periphery such that a line projected in the direction of type surface movement from the leading to the trailing edge of said one type character intersects multiple land area portions whereby a hammer impacting against said land area portions will print a solid block having a periphery substantially corresponding to said substantially rectangular periphery with the spaces between land area portions being filled in as a consequence of smear attributable to the relative movement between said type surface and hammer.

4,102,269

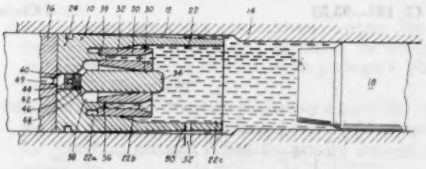
LIQUID PROPELLANT WEAPON SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 17, 1977, Ser. No. 778,770

Int. Cl.² F42B *5/16, 9/14*

U.S. Cl. 102—38 LP **11 Claims**



1. A round of ammunition comprising:

a projectile having a first average density;

a cavity generator having a second average density;

a charge of liquid propellant having a third average density which is greater than said second average density; and

a cartridge case;

said cavity generator having a forward face, an aft face, and a passageway extending longitudinally therebetween; and

said cartridge case having means for obturating said passageway.

4,102,270

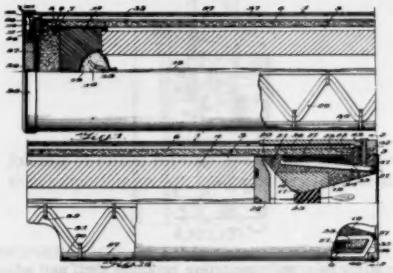
DISPOSABLE BOOSTER

Silvio P. Gualillo, Baltimore County; Russell L. Hopping, Towson; Ivan E. Tuhy, Baltimore; Charles L. Barker, Dundalk, and Herbert H. Buschers, Towson, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed May 8, 1951, Ser. No. 225,174

Int. Cl.[2] F42B *15/10*

U.S. Cl. 102—49.5 6 Claims



1. A booster comprising an open ended housing, a propellant charge carried within said housing, a trap assembly interposed between said propellant and opening for restraining said propellant, said trap including an annular ring member, and a plurality of radially extending arms held in disengageable interlocking relation with said ring member, said interlocking arms and ring member being arranged to maintain a rigid assembly upon the application of force from one direction, but which are readily collapsible upon the removal of said force after the booster has been expended.

4,102,271

ARMOR-PIERCING TANDEM SHELL OR PROJECTILE

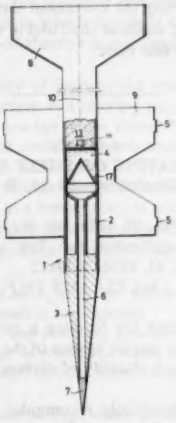
Karl-Wilhelm Bethmann, Duesseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,378

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 26054557

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 8 Claims



1. An improved armor-piercing tandem projectile particularly adapted for piercing multi-layered armored targets and having a shell body incorporating at least two armor-piercing means which differentiate each other at least with respect to their moments of impacting the target, the rearmost one of the armor-piercing means including a shaped hollow explosive charge; the improvement comprising:

a first most forwardly disposed armor-piercing means, relative to the target, having the first, in point of time, impacting moment of said armor-piercing means, acting by its kinetic energy;

a second most rearwardly disposed armor-piercing means having a chamber;

said first and second armor-piercing means being rigidly secured to each other,

shaped hollow explosive charge means operatively mounted in said chamber, said shaped hollow explosive charge means including spike forming means;

said first armor-piercing means being formed as an impact body which has a fowardly extending conduit in communication with said shaped hollow explosive charge means.

4,102,272

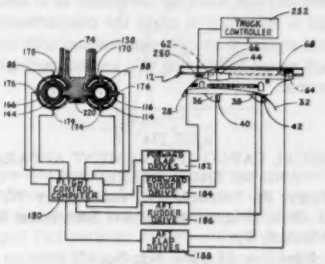
HIGH-SPEED TRANSPORTATION SYSTEM

Elvest L. Lehl, 2450 Newell, Wichita, Kans. 67203, and Glen W. Zumwalt, 6311 Marjorie La., Wichita, Kans. 67208

Filed May 27, 1975, Ser. No. 580,872

Int. Cl.[2] B60V *3/00*; B61B *13/08*

U.S. Cl. 104—23 FS 28 Claims



20. A high-speed transportation system comprising an elongated guide means, a self-propelled aerodynamically dirigible aircraft disposed exteriorly of, below and operatively connected by means carried at the top of the aircraft to the guide means to travel a path guided by the guide means, means for directably controlling the aircraft to travel said path including sensing means carried by the aircraft in operative association with the guide means to sense displacement from the latter with the means for controlling the aircraft operating to maintain the displacement at a set value and means pivotally supporting the guide means at spaced positions for lateral swinging movement.

4,102,273

APPARATUS FOR POSITIONING BATTERY-OPERATED ROAD VEHICLES AT BATTERY REPLACEMENT STATIONS

Theodor Merkle, Itzelberg, and Paul Meyer, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,946

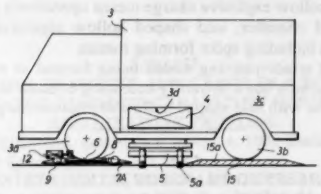
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558637

Int. Cl.[2] B60K *1/04*; B60S *5/00*

U.S. Cl. 104—34 9 Claims

1. Apparatus for positioning battery operated road vehicles which have battery compartments at battery replacement stations wherein fresh batteries are moved toward or spent batteries are moved away from the compartments of vehicles along a predetermined path, comprising a threshold structure which can be traversed by the wheels of a vehicle and includes a ground-contacting first carriage movable back and forth in a

first direction, and a second carriage movable in said first carriage back and forth in a second direction substantially at right angles to said first direction, said second carriage being adapted to support the wheels of a single set of aligned wheels on a vehicle which is driven onto said structure in the general direction of movement of said first carriage and said second carriage having socket means arranged to receive at least one wheel of said single set of aligned wheels, the movement of



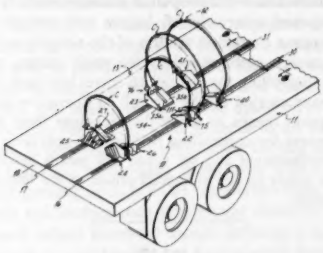
said first carriage resulting in movement of the vehicle in said first direction and the movement of said second carriage resulting in a change of orientation of the vehicle about a substantially vertical axis while said set of aligned wheels is supported by said second carriage when the movement of at least one of said carriages is necessary to move the compartment of the vehicle at said station to an optimum position with respect to said path; and means for driving said second carriage in said second direction.

4,102,274

CYLINDRICAL CARGO SECUREMENT APPARATUS AND METHOD THEREFORE

Steven L. Feary, Ft. Mitchell, Ky., and Bradley W. Boesel, Cincinnati, Ohio, assignors to Carriers Securement Systems, Inc., Ft. Mitchell, Ky.

Filed Feb. 18, 1976, Ser. No. 659,016
Int. Cl.[2] B60P *7/12, 7/16*; B61D *45/49, 49/00*
U.S. Cl. 105—367 **31 Claims**



1. Apparatus for securing objects to supporting platforms and including:

a pair of spaced apart parallel elongated tracks attached to said platform;

a pair of end chocks, each one of said end chocks selectively fixed to a respective track;

a pair of adjustable chocks, each one of said adjustable chocks slidably mounted in a respective track;

a pair of anchor means, each of said anchor means being movable along its respective track and being selectively fixable to a respective track proximate an adjustable chock, and

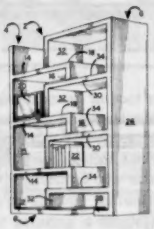
means operatively connecting each adjustable chock to a respective anchor means for moving said adjustable chocks against an end of said object and with respect to said anchor means when said anchor means is selectively fixed to said respective track.

4,102,275

ADJUSTABLE MODULAR BOOKCASE

Albert M. Spound, Royal Crest Estates 10 Newcastle Dr., Nashua, N.H. 03060, and Richard D. Horowitz, 180 Beacon St., Boston, Mass. 02116

Filed Apr. 13, 1977, Ser. No. 787,272
Int. Cl.[2] A47B *45/00*
U.S. Cl. 108—92 **12 Claims**



1. An adjustable, self-supporting, modular shelf unit adapted to stand on a horizontal floor comprising:

first and second shelf sections each comprising:

a single substantially upstanding side support;

a plurality of spaced horizontal shelves each extending inwardly from the respective side supports;

a central support extending substantially vertical from each of said spaced horizontal shelves;

each horizontal shelf of said first section disposed in vertical, offset, interdigitated, meshed relation to each horizontal shelf of said second section;

said first and second shelf sections being movable inwardly and outwardly with respect to one another in the horizontal plane;

the upper surface of each shelf of each section providing vertical support to the confronting central support of the other section;

the outer end of each central support of said first section being slidable on the confronting surface of the corresponding shelf of said second section;

the outer end of each central support of said second section being slidable on the confronting surface of the corresponding shelf of said first section;

means for supporting the lowermost shelf of said adjustable, self-supporting, modular shelf unit in substantially parallel relationship to said floor.

4,102,276

DECORATING OR SHELF SYSTEM

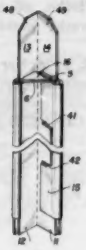
Bruno Roveroni, Eisenbahnstrasse 10, D 6079 Sprendlingen, Germany

Filed Jun. 18, 1975, Ser. No. 587,835
Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2405510; Jun. 18, 1974, 2429122
Int. Cl.[2] A47F *5/11*
U.S. Cl. 108—156 **3 Claims**

1. A foldable blank for forming a column element for a knock down shelf or display system of the type having upright columns supporting a plurality of shelves therebetween comprising:

an elongated substantially rectangular flat blank having a plurality of parallel score lines extending longitudinally of said blank and defining a plurality of rectangular panel portions thereof, said blank being foldable on said score lines to form a column having two sides extending at right angles to each other, each side comprising at least two of said panel portions folded flat against each other, and at

least one panel portion having a score line at an angle to said parallel score lines defining a further panel portion



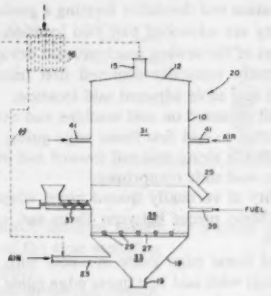
foldable to extend between said two sides and forming a shelf supporting surface integral with said column.

4,102,277

INCINERATION OF LIME-CONDITIONED SEWAGE SLUDGE WITH HIGH SULFUR FUEL

Clarence J. Wall, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,169
Int. Cl.[2] F23G 5/02
U.S. Cl. 110—342 9 Claims



1. An economical, non-polluting process for the disposal of a sewage waste stream in which the waste stream is dewatered and the sludge formed thereby is incinerated, comprising the steps of;

a. adding a quantity of lime to the sewage waste stream sufficient to function as a filtering aid,

b. dewatering the sewage waste stream by filtering to form sludge filter cake containing a relatively large amount of lime therein,

c. incinerating the sludge filter cake using a high-sulfur fuel as auxiliary fuel at a temperature at which the sulfur present in the fuel and in the sludge filter cake reacts with the lime in the sludge filter cake and with oxygen to produce $CaSO_4$ and

d. removing the $CaSO_4$ with the solids produced by the incineration operation for disposal.

9. An economical, non-polluting process for the disposal of a sewage waste stream in which the waste stream is dewatered and the sludge produced thereby is incinerated, comprising the steps of;

a. adding lime to said sewage waste stream as a filtering aid in the amount of at least 10 pounds per 100 pounds of dry solids in the filter cake produced in the dewatering step hereafter,

b. dewatering the sewage waste stream in a filter press to form sludge filter cake containing lime in an amount at least 50% in excess of that required for reaction with the sulfur present in the incineration step hereafter,

c. incinerating the sludge filter cake in a fluidized bed reactor at a temperature from about 1200° F up to about 1600° F using a high-sulfur auxiliary fuel whereby the sulfur present during incineration reacts with the lime in the filter cake and with oxygen to produce $CaSO_4$ and

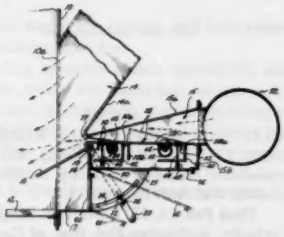
d. removing the $CaSO_4$ with the other solids, including ash, produced during incineration.

4,102,278

FURNACE HOGGED FUEL DISPERSER USING MODULATED AIRFLOW

Gerald P. McManama, Seattle, Wash., assignor to Wyatt Engineers, Inc., Seattle, Wash.

Filed May 11, 1977, Ser. No. 795,768
Int. Cl.[2] F23K 3/02
U.S. Cl. 110—105 10 Claims



1. Apparatus for dispersing hogged fuel pneumatically with improved combustion distribution over the area of a furnace fire grate comprising, in combination with means for discharging hogged fuel particles downwardly toward the grate in a free fall trajectory, air duct means adapted to receive pressurized air at one end and having a discharge orifice at its opposite end directed in intersecting relationship with said trajectory to blow the fuel particles therefrom out over the area of the grate, tandemly positioned oscillatable airflow restrictor gates each operably mounted in said duct means to vary the air velocity flowing through said orifice, and drive means operable to oscillate one such gate at a multiple of the frequency of the other.

4,102,279

FURNACE PLANT

Rupert Gröschl; Josef Gröschl; Ludwig Gröschl, and Johann Gröschl, all of Wald, Schoberpass, Austria, assignors to Stefan Hahn, Styria; Norbert Drescher, Burgenland and Firma Johann Gröschl, Styra, all of Austria

Filed Nov. 24, 1976, Ser. No. 744,607
Claims priority, application Austria, Nov. 28, 1975, 9068/75; Jul. 8, 1976, 5023/76
Int. Cl.[2] F23G 5/00
U.S. Cl. 110—234 19 Claims

1. A furnace comprising:

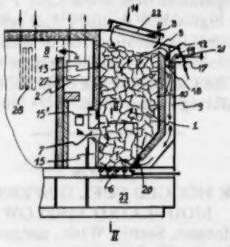
a housing forming a charging shaft and an adjoining combustion chamber communicating with each other through a connection near the bottom of said shaft;

a grate below said connection underneath said shaft;

partition means in said housing separating said shaft from an upright duct communicating with said shaft through an upper port and a lower port adjacent said grate;

intake means above said shaft supplying same with fresh air for sustaining a combustion of a solid charge in said shaft, part of said fresh air mingling with gaseous products of incomplete combustion to form a mixture recirculated via

said upper port, said duct and said lower port to said shaft for further burning; and



baffle means above said shaft for preventing the escape of said gaseous products via said intake means.

4,102,280

FEED DEVICE FOR FLEXIBLE WORKPIECES, ESPECIALLY FOR A SEWING MACHINE

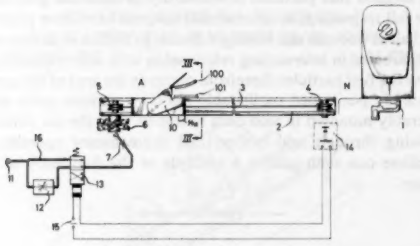
Franz Hannemann, Detmold, Germany, assignor to Durkoppwerke GmbH, Bielefeld, Germany

Filed Feb. 16, 1977, Ser. No. 769,202

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607235

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **3 Claims**



1. A feed-control device for flexible workpieces, comprising:

a rail defining a transport path for fabric workpieces to be advanced;

a clamp engageable with said workpieces and displaceable from a starting location to another location;

feed means engageable with said workpieces for advancing said workpieces to draw said clamp from said starting location to said other location; and

retarding means connected with said clamp for applying an adjustable retarding force thereto resisting the displacement of said workpieces from said starting location to said other location with a variable retardation capable of reduction to substantially zero, said retarding means including a cable displaceable along said rail and connected to said clamp, said device including a turbine operatively connected to said cable, a nozzle trained on said turbine, said nozzle being connected to a source of compressed air, a throttle connected to said source and a bypass line connected in parallel to said throttle, and means for selectively connecting said throttle and said bypass line to said nozzle.

4,102,281

WORKPIECE GUIDE DEVICE FOR SEWING MACHINES

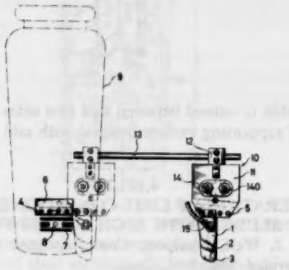
Harald Collbrunn, Spenge; Hermann Breitinger, Bielefeld, and Herbert Diekmann, Vlotho, all of Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,880

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554022

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **4 Claims**



1. The combination with a sewing machine having a stitching location on a sewing table, of a fabric-guide device capable of the controlled feeding of a pair of fabric pieces to said stitching location and thereafter forming a guide for the fabric pieces as they are advanced past said location by the fabric-feed members of the sewing machine, said device comprising:

a substantially vertically disposed first linear edge guide fixed on said table adjacent said location;

a guide rail mounted on said machine and extending generally parallel to said first linear edge guide;

a slide shiftable along said rail toward and away from said location, said slide comprising:

a plurality of vertically spaced plates adapted to receive said fabric pieces between them and separating said pieces;

a second linear edge guide movable with said slide and coplanar with said first linear edge guide while forming a guide surface for the individual pieces separated by said plates, and

a pneumatic fabric clamp on said slide for securing said pieces against at least one of said plates; and

adjustable abutment means along said track for limiting the displacement of said slide therealong and defining extreme positions of said slide proximal to said location and remote therefrom.

4,102,282

METERING DEVICE FOR SEWING MACHINES

James C. Hsiao, Chicago, and Robert H. Gaudlitz, Cary, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Apr. 1, 1977, Ser. No. 783,907

Int. Cl.² D05B *21/00, 27/14*

U.S. Cl. 112—121.26 **21 Claims**

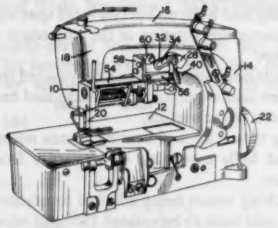
1. An attachment for use with a sewing machine having a mechanism drive means, and lever means operably connected to said drive means to be reciprocated thereby, said attachment comprising:

a support means;

roller means carried by said support means including coaxially aligned first and second one way coupling means being associated therewith;

one of said coupling means being in operative engagement

with said lever means for driving said roller means upon one direction of movement of said lever means; and



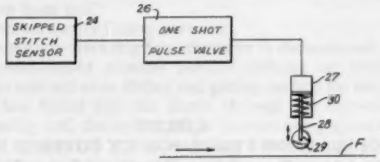
means for dependently associating said coupling means such that return movement of said lever results in the other coupling means driving said roller means.

4,102,283

SKIPPED STITCH DETECTOR FOR CHAIN STITCH SEWING MACHINES

John L. Rockerath, Utica, and John H. Blum, Cold Brook, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,920
Int. Cl.[2] D05B *51/00*
U.S. Cl. 112—131 **7 Claims**



1. A skipped stitch detector system for a chain stitch type sewing machine of the type including

(a) a thread supply,

(b) a thread tension control device,

(c) a reciprocating sewing needle,

(d) thread guide means between said thread tension control device and said needle, said detector system comprising,

(e) low mass, yieldably displaceable means engaging the thread between said thread guide means and said tension control device and urging said thread out of its normal, guided path, as a function of the momentary tension in said thread,

(f) said displaceable means being cyclically displaceable through a limited distance during normal sewing and being displaceable through a further distance in response to momentary abnormal loss of tension in said thread, and

(g) sensor means positioned in the path of said yieldably displaceable means responsive to an abnormally displaced position of said yieldably displaceable means for executing a control function.

4,102,284

STACKER MECHANISM

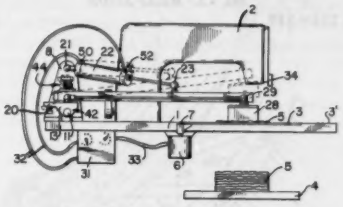
Günter Rohr, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,103
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640148
Int. Cl.[2] D05B *33/00*
U.S. Cl. 112—121.29 **11 Claims**

1. A stacker mechanism having an arm means and a wiper mechanism secured to said arm means, said stacker mechanism comprising:

a frame means;

a support means having first and second pivotal connections, said first pivotal connection adapted to rotatably mount said support means on said frame means, the second pivotal connection being adapted to pivotally mount one end of said arm means;



a single actuator means for moving said arm means about said pivotal connections; and

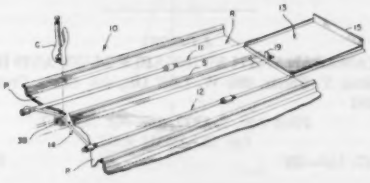
a motion retarding assembly means operatively associated with said arm means for imparting thereto a frictional resistance to turning movement thereby creating a higher coefficient of friction at said second pivotal connection relative said first pivotal connection whereby movement of said arm means will result in said wiper mechanism being moved in the direction of least resistance.

4,102,285

KNOCK-DOWN STARTING PLATFORM FOR A ROOF SEAMING MACHINE

James W. Martin, Kansas City, and John R. Hardwick, Gower, both of Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed May 5, 1977, Ser. No. 794,150
Int. Cl.[2] B21D *39/00*
U.S. Cl. 113—54 R **7 Claims**



1. A kit for a knock-down starting platform for a roof seaming machine, comprising: a machine support platform, a first pair of elongate side frame members connected at one end to the support platform, a second pair of elongate side frame members, a pair of couplings adapted to be mounted on ends of said side frame members for releasably coupling each of said first side frame members to a corresponding one of said second side frame members, a bridge member, connecting means on said bridge member for releasably connecting said bridge member to said second frame members on the other ends of said frame members so that said bridge member is located on the other end of the side frame members and spans the distance therebetween, said bridge member being bent upwardly between the ends thereof to define a clearance space for accommodating therebeneath a seam between adjoined roof panels and said pairs of side frame members being releasably joined together for ease in storage, handling and shipping.

4,102,286

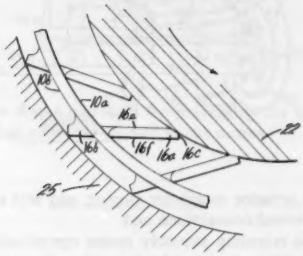
METHOD OF MAKING LOUVERED CONNECTORS AND CONTACT ELEMENTS THEREOF

Glenn W. Johnson, Jr., Summit, and Paul F. Lindlau, East Orange, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Division of Ser. No. 683,527, May 5, 1976, Pat. No. 4,039,238, which is a continuation of Ser. No. 503,783, Sep. 6, 1974, abandoned. This application May 20, 1977, Ser. No. 798,898

Int. Cl.[2] B21D *53/00*

U.S. Cl. 113—119 **3 Claims**



1. A method for making a contact element of the type having resilient contact fingers engageable with a complementary contact element comprising the steps of:

(a) forming transverse openings through opposed first and second flat surfaces of an elongate strip member; then

(b) displacing outwardly of said strip member first surface an end portion of each strip member expanse between respectively adjacent transverse boundaries of successive of such openings; then

(c) forming said strip member into a cylinder with said end portions of said expanses thereof extending interiorly of said cylinder; then

(d) inserting into the interior of said cylinder a cylindrical hone of diameter greater than the diameter of the locus of the extremities of said end portions and equal to the diameter of said complementary contact element; and then

(e) rotating said hone, thereby removing a part of each said end portion to define a curved surface at the extremity of each said end portion.

4,102,287

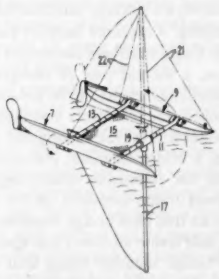
CATAMARAN WITH SWINGABLE MAST AND HULLS

Hamilton Y. Ferris, 880 W. Cliff Dr., #6, Santa Cruz, Calif. 95061

Filed Apr. 5, 1977, Ser. No. 784,667

Int. Cl.[2] B63H *9/04*

U.S. Cl. 114—39 **5 Claims**



1. In a boat:

a. a center supporting structure disposed on a horizontal plane and including a forward spar,

b. a pair of hulls at each side edge of said center supporting structure and connected together by said forward spar,

c. hull locking means attaching said hulls to said forward spar, said locking means having bearing means rotatably mounting said hulls on said forward spar so that said hulls are mounted for rotation at the side edges of said central structure,

d. said hulls normally extending downward from said center structure into water and supporting said central structure above the water surface,

e. locking means on said bearing means normally maintaining said hulls extending downwardly from said center structure,

f. said locking means being adapted to release said hulls and permit said hulls to be rotated 180° and relocked whereby said center structure can be turned over to an inverted position and said hulls repositioned to extend downward from said inverted position of the center structure, and

g. a mast supporting bearing rotatably mounted on said forward spar of the boat, said mast supporting bearing journally receiving said forward spar therethrough so that said mast supporting bearing is rotatably about said forward spar through an angle of at least about 180° so that a mast supported on said forward spar is movable from a first position extending vertically downwardly from said forward spar to a second position about 180° from said first position with said mast vertically upwardly from said forward spar so that a capsized boat can be righted by one person.

4,102,288

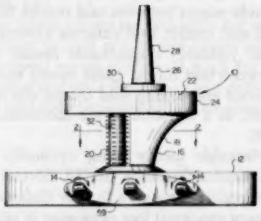
OPERATIONS VESSEL FOR ICE COVERED SEAS

Holland James Berry, Calgary, Canada, and George W. Morgan, Houston, Tex., assignors to Sun Oil Company Limited, Calgary, Canada

Filed Feb. 28, 1977, Ser. No. 772,787

Int. Cl.[2] B63B *35/08, 35/12*

U.S. Cl. 114—41 **4 Claims**

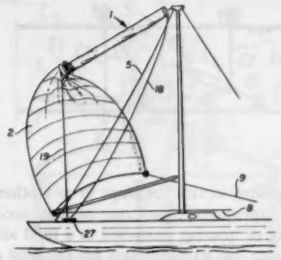


1. An improved monopod operations platform for ice covered seas of the type having a deck structure atop an intermediate hull upstanding from a submersible flotation hull, wherein the improvement comprises said intermediate hull having a bow region constructed in the form of a nautical wedge and a stern section adapted for ice disaggregation in both a transit and non-transit mode, said stern section including a pair of ice disaggregating drums mounted for counter-rotation in a generally parallel relationship for eliminating resultant reaction torque therefrom, said improvement further comprising a plurality of fully vectorable thrusters provided around the submersible hull, said thrusters being adapted for rotation about generally horizontal axes for obtaining programmable thrust vector control.

4,102,289
DEVICE FOR SETTING AND FURLING SAILS

Bengt Ebbe Oscar Ebbeson, Järnvägsgatan 8, 302 49 Halmstad, and Björn Alvar Wisjö, Nyvangen 1, 302 57 Halmstad, both of Sweden

Continuation-in-part of Ser. No. 609,789, Sep. 2, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,916
Claims priority, application Sweden, Sep. 2, 1974, 7411067
Int. Cl.² B63H *9/10*
U.S. Cl. 114—104 7 Claims



1. A device for attachment to an end of an elongated longitudinally collapsible sleeve of a thin textile sheet material for furling a light sail into the sleeve, the device comprising

(a) two identical substantially rigid, funnel-shaped members assembled into a detachable unit, each member having

(1) an inner end,

(2) an outwardly flaring outer end,

(3) a portion extending from the outer to the inner end, the funnel-shaped member portion defining an entirely smooth and even sliding and gliding surface for the sail when furled into the sleeve through the outwardly flaring end, the surface of the portion being generated by a spherical curve extending over substantially a quarter of a circle and the inner end lying on a circle generated by an innermost point of said curve whereby none of the funnel-shaped member extends radially inwardly beyond the circle, and

(4) a substantially semi-circular cylindrical flange extending about the inner end and defining a substantially semi-circular groove therein, the two funnel-shaped members being assembled coaxially and symmetrically with respect to a median plane extending between the circular inner ends of the members and the cylindrical flanges being symmetrically arranged with respect to a vertical plane passing through the axis of the funnel-shaped members, a respective one of the flanges matingly extending into a respective one of the grooves, and the length of the flanges being such that an annular space remains between the circular inner ends of the members,

(b) fastening elements holding the flanges in the grooves and thus forming the two funnel-shaped members into the detachable unit, and

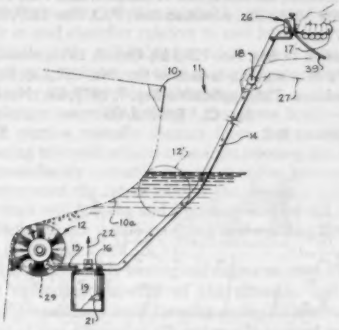
(c) a fastening ring frictionally wedged into the annular space and adapted for attachment to the sleeve end.

4,102,290
UNDERWATER BOTTOM CLEANING SYSTEM AND APPARATUS

David Weiss, 819 Mitten Rd. #39, Burlingame, Calif. 94010

Continuation of Ser. No. 692,841, Jun. 4, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,606
Int. Cl.² B63B *59/00*
U.S. Cl. 114—222 7 Claims

5. In a bottom cleaning system for cleaning underwater hull portions of a vessel comprising means forming a berth alongside which a vessel can approach for cleaning of those underwater hull portions confronting the first named means, a cleaning assembly including cleaning means, an elongate substantially rigid operating arm supporting said cleaning means from an end thereof and extending between said cleaning means and the first named said berth means, means having a controllable buoyancy carried by said operating arm at a position between said berth means and said cleaning means disposed along said



member and serving to lift and lower said cleaning means into and out of cleaning relation with respect to said hull portions, and means operable from said berth for varying the buoyancy of said buoyant means to vary the force supplied between the cleaning means and said hull portions.

4,102,291
ELECTRICAL GENERATOR FOR A SAILBOAT

Ralf Sebald, Vorhoelzerstrasse 3, 8000 Munich 71, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 728,010
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544939
Int. Cl.² B63G *8/42;* F03B *13/10*
U.S. Cl. 114—244 7 Claims

1. The combination comprising:

a sailboat displaceable through the water and having a hull partially above and partially below the waterline;

an electrical generator on said sailboat having an input operable for generating electricity;

a propeller immersible in the water;

a bracket mounted on said hull below said waterline;

a hollow sleeve passing in watertight fashion through said hull between said generator and said propeller and through a location above said waterline; and

a core rotatable in and passing through said sleeve, said core having an inner end connected to said input and an outer end journaled in said bracket for rotation about an axis generally parallel to the normal direction of movement of said sailboat through the water and connected to said propeller, whereby on displacement of said sailboat the

water rotates said propeller and thereby rotates said input to generate electricity.

4,102,292

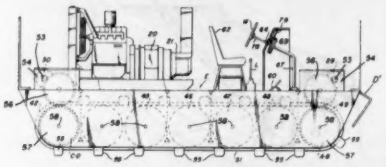
AMPHIBIOUS VEHICLE

Ralph W. Hunter, deceased, late of Jacksonville, Fla., and Marcia Hunter McLaulin, administrator, P.O. Box 1227, Sanford, Fla. 32771

Continuation of Ser. No. 729,813, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,230, Feb. 11, 1976, abandoned. This application Sep. 7, 1977, Ser. No. 831,126

Int. Cl.[2] B60F *3/00*

U.S. Cl. 115—1 R **2 Claims**



1. A vehicle for land or water travel comprising a planar deck and a plurality of depending fins from the underside of the deck, a source of power mounted on the upperside of the said deck, transversely spaced sets of buoyant power drums mounted on power drum axle means supported between the fins selectively rotatably driven by said power source in either a clockwise or a counterclockwise direction, said transversely spaced sets of power drums each being mounted on said axle means driven by said power source, one of each set of power drums being mounted at the respective fore and aft ends of the vehicle, dual spaced sets of buoyant idler drums mounted on idler drum axle means in substantially parallel relation to and longitudinally between said spaced sets of fore and aft power drums mounted on said power drum axle means, an endless belt reeved around each of said sets of transversely spaced sets of buoyant idler drums, said endless belts having inflated transverse cleats thereon to help maintain said deck above a water line of the vehicle, gear means for each of said power drums keyed on said axle means to rotatably drive said endless belts with said cleats to effect propulsion of said vehicle and said buoyant idler drums and said inflated transverse cleats, said source of power comprising a diesel engine directly coupled to drive a generator means and provide energization of port and starboard electric motors, each motor having a rotor shaft and a drive gear in mesh with the said gear means of said power drums to impart drive to each respective set of power drums at the fore and aft of said vehicle, steering means for selectively changing the speed of the power drums on the left or right of the vehicle, said steering means comprising a steering wheel, a steering column and a sleeve below said steering wheel on said steering column, said steering wheel being keyed to said column to turn the same to the right or left in said sleeve, rehostat means including respective port and starboard resistance sections supported by said sleeve around said steering column, a pusher arm keyed to said steering column movable to right or left by said steering wheel, ring mounted slider arms movable over said resistance sections by said pusher arm responsive to rotation of said steering wheel and steering column, said rehostat resistance sections and slider arms being in circuit between said generator means and said motor means for selectively varying the resistance of said resistance sections in circuit with said port and starboard motors drivably coupled by said motor drive gears to the gear means of the said power drums on the left or right side of the vehicle, to thereby change the speed of the power drums on the left or right side of the vehicle, and a manual lever means to provide a forward, neutral and reverse control of the vehicle drive motors, to thereby coact with the manual turning of said steering wheel for control of the vehicle.

4,102,293

DEVICE FOR PROPELLING SHIPS

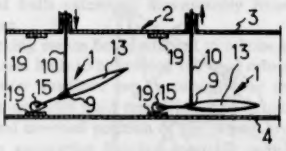
Olivier Geoffroy de la Roche Kerandraon, Paris, France, assignor to Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.", France

Filed Jun. 20, 1977, Ser. No. 808,393

Claims priority, application France, Jul. 29, 1976, 76 23269

Int. Cl.[2] B63H *1/30*

U.S. Cl. 115—28 R **8 Claims**



1. In a propelling device for ships or any other vessels or watercraft, comprising at least one surface accommodated within a casing or housing immersed in a fluid and provided with an inlet port and an outlet port for the fluid as well as a lower wall and an upper wall between which the said surface is subjected to a to-and-fro movement while at the same time being allowed to freely oscillate under the action of at least one actuating shaft connected to the said surface by a movable joint, the improvements consisting in that the said surface is constituted by a main blade or wing actuated by the said shaft and located within the outlet-port side of the said casing, the said main blade being connected to at least one smaller leading blade located within the inlet-port side of the said casing, a free space being provided between the said main blade and the said smaller blade, at least the lower wall of the casing being provided with a proximity detector arranged in the region of the said smaller blade.

8. In a propelling device for ships or any other vessels or water craft, comprising at least one surface accommodated within a casing or housing immersed in a fluid and provided with an inlet port and an outlet port for the fluid as well as a lower wall and an upper wall between which the said surface is subjected to a to-and-fro movement while at the same time being allowed to freely oscillate under the action of at least one actuating shaft connected to the said surface by a movable joint, the improvements consisting in that the said surface is constituted by a main blade or wing actuated by the said shaft and located within the outlet-port side of the said casing, the said main blade being connected to at least one smaller leading blade located within the inlet-port side of the said casing, a free space being provided between the said main blade and the said smaller blade, the said main blade being connected to two superposed smaller blades braced or tied together by rods, bars or the like.

4,102,294

COFFEE POT PERK ALARM

Charles R. Barber, Lufkin, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1977, Ser. No. 791,978

Int. Cl.[2] A47J *27/212*

U.S. Cl. 116—103 **1 Claim**

1. A coffee pot perk alarm for a coffee pot having a perforated tube removably positioned essentially coaxially in the pot and extending from the bottom of the pot to the top of the pot whereby water flows upward through the tube to the top thereof and through the top thereof when the coffee perks and a lid removably covering the pot at the top of the tube, said coffee pot perk alarm comprising

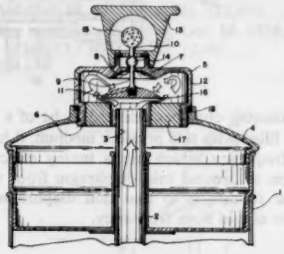
an alarm housing coaxially removably coupled to the lid via a hole coaxially formed through the lid, and accommodat-

ing the top of the tube coaxially therein, said housing opening into the pot via the hole;

a collar having a coaxial bore formed therethrough provided in the top of the alarm housing, spaced above the lid and in coaxial relation with said lid;

a stem in the housing extending through the bore and having spaced opposite upper and lower ends;

a substantially spherical member coaxially affixed to the stem at an intermediate point thereof and having a diameter greater than the diameter of the bore of the collar and resting in said bore whereby said stem is freely rockable in said collar;



a hollow shell mounted on the stem at the upper end of said stem and having a rattle member encased therein and producing an alarm sound whenever it strikes said shell; and

an actuating member mounted on the stem at the lower end of said stem and being positioned in close proximity with the top of the tube whereby when the coffee perks water flows through the top of the tube and strikes the actuating member producing an oscillatory motion of the stem about the spherical member thereof and causing the rattle member to strike the shell to produce a series of alarm sounds.

4,102,295

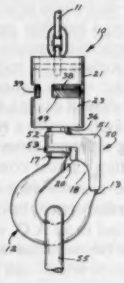
LOAD INDICATING APPARATUS

Edward J. Crook, Jr., Tulsa, and Charles R. Garrett, Collinsville, both of Okla., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Continuation of Ser. No. 573,438, May 1, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,686

Int. Cl.[2] B66C *1/40*

U.S. Cl. 116—114 R **9 Claims**



1. A load indicator usable with load lifting machinery having a rated load capacity and connectable between a load line and a load handling member of the machinery, said indicator including:

a housing having a generally upright side wall partially defining a chamber, said housing having a lower end closed by an end wall and an upper end connectable to a load line;

said housing end wall being provided with an opening;

first connecting means securing a load line to said housing;

a deflectable plunger assembly located in said chamber and extending therefrom;

said deflectable plunger assembly being vertically movable in said chamber relative to said housing and freely rotatable in said chamber relative to said housing;

said housing side wall being provided with at least one sight opening permitting viewing said plunger assembly in the chamber from outside of the housing;

said plunger assembly having a transverse head with a side wall portion visually distinct from the outside of said housing side wall adjacent the sight opening and vertically intermediately movable in said chamber between a position toward the upper end of the chamber out of view through said opening and a position toward the lower end of the chamber totally covering said opening from within the chamber;

said plunger assembly having rod means secured to the head and extending outward of the chamber and housing through said end wall opening such that vertical movement of that portion of the rod means located outward of the chamber and housing results in directly corresponding movement of the transverse head in the chamber;

second connecting means on the rod means connecting it to a load handling member, said second connecting means including a threaded opening in said rod means in engagement with a threaded shank of the load handling member;

bias means in said chamber disposed between said head and a portion of the housing biasing said head toward the upper end of the chamber to locate said visually distinct side wall portion in the out-of-view position, said bias means including a disc spring located in said chamber assembled in said chamber under a percentage of spring deflection when said side wall portion is in the out-of-view position;

swivel bearing means disposed between said bias means and said portion of the housing to facilitate free rotation of the plunger assembly in said chamber relative to said housing when said plunger assembly is vertically deflected responsive to a load;

said head being vertically movable in said chamber against the action of the biasing means responsive to a tension load between the load line and the load handling member a distance representative of the extent of loading on the load handling member as compared to a rated load capacity toward said position with said side wall portion totally covering said opening;

said bias means being linearly calibrated to provide biasing force equal to a preselected load value upon movement of said visually distinct side wall portion from said out-of-sight position to said position totally covering said opening; and

a circumferential shoulder located on the side wall in the chamber in position to intercept said head and prevent further movement thereof after said side wall portion moves to said position totally covering said opening.

4,102,296

MARINE SAFETY SIGNAL DEVICE

Harold E. Felix, 16142 Mariner Dr., Huntington Beach, Calif. 92649

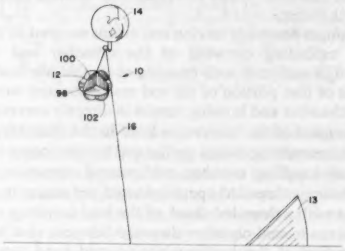
Filed Mar. 16, 1977, Ser. No. 778,044

Int. Cl.[2] B63B *45/00*; **G09F** *9/00*

U.S. Cl. 116—124 B **1 Claim**

1. A marine safety signal device, which comprises an elongated line member, one end of said line member secured to a boat, a balloon element secured to another end of said line element, said balloon element including an inflatable bladder portion, a cylindrically shaped sleeve having an open end and a closed end, said bladder portion secured into said open end of

said sleeve, a one way check valve element disposed in said closed end of said sleeve, a cylindrically shaped tubular element, one end of said tubular element affixed onto said closed end of said sleeve around said valve, a radar detectable element formed from three perpendicularly intersecting metallic reflecting elements having holes therethrough, said other end of said line member tied through one of said holes, means for inflating said balloon element including a bottle shaped housing having a base with a center opening therethrough, an upwardly extending sidewall and a neck portion, said tubularly shaped element sealed by a water and pressure sensitive adhesive within said neck portion, a needle like piercing element disposed in said cylindrically shaped element and extending outwardly from a free end of said tubular element, a gas cylinder having a base and an upwardly extending sidewall and a neck portion disposed in a chamber of said bottle shaped housing, said gas cylinder having a gas lighter than air disposed therein, a piercable valve element disposed in said neck of said



gas valve, means for pushing said gas cylinder forwardly within said bottle shaped housing whereby said piercing element pierces said piercing valve, wherein said pushing means includes a cylindrically shaped rod slidably disposed through said center opening of said base of said bottle shaped housing, a first disc element affixed to one end of said rod within said chamber, said first disc element hitting against said base of said gas cylinder, a second disc element affixed to another end of said rod externally to said bottle shaped housing, means for hitting said disc element having a hammer arm, said hammer arm pivotally mounted in a bracket secured to said boat, said hammer arm having a head at one end thereof, said head hitting against said second disc element, a spring element, said spring element communicating between said boat and said hammer arm, means for maintaining said hammer arm in a cocked position including a water soluble thermoplastic rod, said water soluble rod secured between said boat and another end of said hammer arm, said rod dissolved by water to release said hammer arm from said cocked position.

4,102,297

ACOUSTICAL SIGNAL APPARATUS

Francis X. Reilly, Lyndhurst, N.J., assignor to Leslie Co., Parsippany, N.J.

Filed Apr. 15, 1977, Ser. No. 787,972

Int. Cl.[2] G10K *9/04*

U.S. Cl. 116—142 FP **9 Claims**

1. An acoustical signal apparatus, comprising:

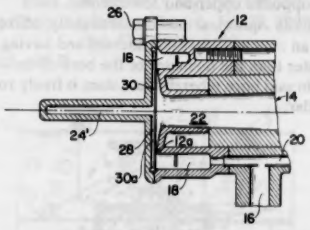
a housing having an inlet for receiving a pressure medium to operate the apparatus and having an outlet for the pressure medium;

a first chamber connected to said inlet and said outlet for receiving said pressure medium from said inlet;

a sound-emitting horn connected to said housing for receiving said pressure medium from said outlet and having a predetermined horn frequency;

an elongated resonating chamber having one end in continuous fluid communication with said housing and the other end continuously closed;

a diaphragm connected to said housing between said first chamber and said resonating chamber for oscillating movement in response to pressure changes in said first chamber and said resonating chamber, said diaphragm including means for controlling the flow of said pressure medium from said first chamber to said outlet and to said horn, said diaphragm having a natural frequency higher than said horn frequency;



said resonating chamber selected to be of a size such that when filled with said pressure medium, it has a characteristic frequency which has a tuning effect on said diaphragm to prevent said diaphragm from vibrating at its natural frequency so that said diaphragm is forced to vibrate at said horn frequency.

4,102,298

DEVICE FOR DEPOSITION OF SEMI-CONDUCTOR MATERIAL

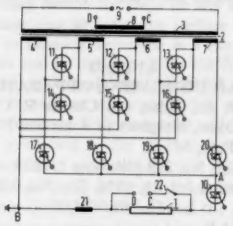
Wolfgang Dietze, Munich, and Hans Stut, Groebenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 10, 1976, Ser. No. 694,717

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2528192

Int. Cl.[2] C23C *13/04*; H05B *1/02*

U.S. Cl. 118—5 **18 Claims**



1. A device for the deposition of semiconductor material, in particular silicon, from a reaction gas permitting the thermal separation of the respective semiconductor material and the deposition upon the surface of a rod-shaped carrier made of semiconductor material which is heated within the reaction gas, in which the rod-shaped carrier, for the heating thereof, is supplied from a supply line over a remote-control electronic switch, with heating current from an alternating voltage source, with the heating current controlled over an auxiliary voltage actuating the remote-control electronic switch, the combination of a transformer having a primary winding adapted to be connected to an A.C. voltage source, said transformer having at least two separate secondary windings of like electrical characteristics, which can be applied in series with the rod-shaped carrier, remote-control electronic switches for selectively connecting said windings in series with the rod-shaped carrier whereby said carrier is selectively connected with an individual secondary winding, a plurality of secondary windings connected in series and/or parallel relation, a zero-voltage oscillation control unit, at least one electronic switch, controlling the flow of heating current through the rod-shaped

carrier, controlled by said zero-voltage oscillation control unit, and an electronic threshold-value switch, responsive to current flow through said rod-shaped carrier, for controlling said remote-control switches to determine the secondary winding or windings operatively connected to said rod-shaped carrier, whereby different voltage-current relationships may be provided thereat.

4,102,299

APPARATUS FOR APPLYING A COATING COMPOSITION ONTO A MOVING WEB

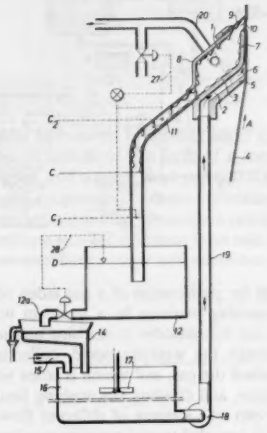
Hans Ivar Wallstén, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Oct. 15, 1975, Ser. No. 622,493

Claims priority, application Sweden, Oct. 16, 1974, 7413043

Int. Cl.² B05C *5/02, 11/04*

U.S. Cl. 118—50 **13 Claims**



1. Apparatus for applying a coating composition to a continuously moving web comprising:

applicator means for applying said coating composition in amounts well in excess of the desired final coating amount;

smoothing means positioned a spaced distance from said applicator means and including a smoothing means housing defining a hollow chamber and a smoothing slot along one side of said housing, said slot being arranged transverse to the direction of movement of the web;

the trailing edge of said slot being formed by a thin flexible blade having a free edge engaging said web for smoothing the coating and removing the excess composition applied to the web, said blade forming an acute angle with the portion of the web moving over said slot;

vacuum means communicating with said hollow chamber and being regulated to draw the web against said slot and thereby control the thickness of the coating applied to the web as well as totally avoiding the need for any backing member for urging the web against the smoothing means slot;

composition removal means communicating with said smoothing chamber for carrying the excess composition out of said chamber;

the excess amount of composition being sufficient to wash solid matter away from the blade and thereby keep the region of the blade smoothing edge free of solid matter;

said applicator means comprising a second housing having a chamber and an elongated applicator slot arranged transverse to the direction of movement of the web whereby the web moves across said applicator slot to receive coating composition prior to smoothing thereof;

the applicator slot and the smoothing slot being separated by a spaced distance, one of said housings having a wall extending between said slots and having an exterior surface facing the moving web and having a length greater than the length of both slots measured in the direction of movement of the web.

4,102,300

APPARATUS FOR CONTINUOUSLY COATING A METAL WIRE AT HIGH VELOCITY

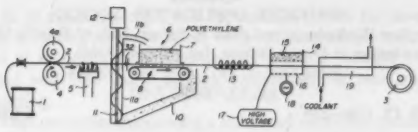
Philippe Robert, Epalinges, Switzerland; Claude Guignard, St. Genis Pouilly, France, and Francis Stagoll, Grand-Lancy, Switzerland, assignors to S.A. des Câbleries & Tréfileries de Cossonay, Cossonay Gare; Société d'Exploitation des Câbles Electriques, Cortaillod and Câbleries de Brugg S.A., Brugg, all of, Switzerland

Division of Ser. No. 605,053, Aug. 15, 1975. This application Dec. 8, 1976, Ser. No. 748,773

Claims priority, application Switzerland, Aug. 16, 1974, 11223/74

Int. Cl.² B05C *19/00*

U.S. Cl. 118—67 **9 Claims**



1. An apparatus for coating a metal wire with thermoplastic material, comprising:

a supply station and a take-up station defining a path for a wire stretched therebetween;

feed means engaging said wire for continuously longitudinally advancing same along said path at an absolute velocity exceeding a threshold value above which a surrounding mass of stationary thermoplastic particles would exert a significant abrasive effect;

a treatment chamber between said stations traversed by said wire and filled with a mass of thermoplastic particles;

preheating means along said path upstream of said treatment chamber for raising the temperature of said wire to a level sufficient to cause adherence of some of said particles thereto;

transport means independent of said feed means disposed at least partly in said chamber for continuously moving at least a portion of said mass proximal to said wire codirectionally therewith at a speed different from the velocity of said wire but with a speed difference less than said threshold value to prevent the occurrence of said abrasive effect; and

reheating means along said path downstream of said treatment chamber for fusing adhering particles on said wire into a continuous envelope.

4,102,301

APPARATUS FOR COATING PLASTIC FILM

Grahame Melvin Reade, Wheathampstead, and Alan Charles Viney, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 506,544, Sep. 16, 1974, Pat. No. 4,002,780, which is a continuation-in-part of Ser. No. 235,718, Mar. 17, 1972, abandoned. This application Oct. 22, 1976, Ser. No. 735,121

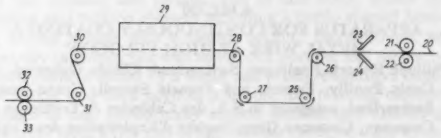
Claims priority, application United Kingdom, Mar. 26, 1971, 7910/71

Int. Cl.² B05C *5/02, 11/02*

U.S. Cl. 118—67 **4 Claims**

1. A device for coating tubular plastics film in lay-flat form comprising two groups each containing a plurality of nozzles substantially equally spaced apart through each of which flowable coating material may be extruded at substantially the same

rate, means for advancing the tubular film in lay-flat form along a path lengthwise between said groups and past said nozzles to receive a plurality of lines of the coating material spaced across each surface of the film, and at least two spread-



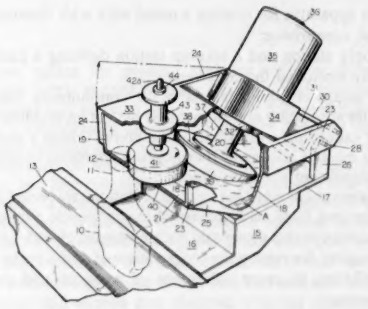
ing rollers spaced apart long said path and in contact with each surface of the film, said rollers rotating in a direction contrary to the direction of advancement of said surfaces, for applying to said surfaces a pressure sufficient to spread and merge the deposited lines of coating material upon said surfaces.

4,102,302

ADHESIVE APPLICATOR DEVICE

Stephen W. Amberg, and John F. Spicer, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 2, 1977, Ser. No. 773,648
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—239 **6 Claims**



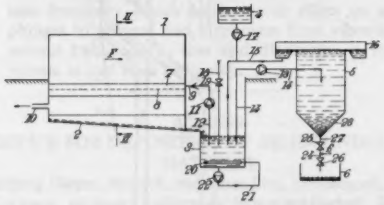
1. The combination comprising
a horizontal power driven conveyor span supporting a plurality of bottles in vertical upright position in a spaced apart series for movement in a single file succession past an adhesive applying station,
a lateral frame at said applying station,
an adhesive application device supported on said frame comprising
a container for a body of liquid adhesive supported on said frame,
a generally horizontal support means pivotally connected to said frame overlying said adhesive body in said container and rotatable between an active adhesive applying position and a rotated remote position,
a feed wheel including a beveled outer peripheral surface,
a shaft connected to said wheel for rotation of the latter about its central axis, said shaft being supported in a vertically inclined position on said horizontal support means, said feed wheel being similarly inclined in adhesive applying position for rotation of a portion of its peripheral surface in the adhesive body,
a motor drive means mounted on said support means and connected to rotate said shaft,
an applicator roller including a substantially cylindrical outer peripheral surface and a central vertical shaft supporting said roller for free rotation, said vertical shaft being rotably supported on said horizontal support means, and
a support for said vertical roller shaft connected to said overlapping pivotal horizontal support means to maintain the peripheral surface of said roller in running engagement with the beveled surface of the feed wheel and engageable while in the active adhesive applying position with the exterior surface of bottles at the adhesive applying station.

4,102,303

PROCESS AND PAINT SPRAY BOOTH USING A WASHING LIQUID AND REUSE THEREOF

André Guy Cordier, Montrouge, and John George Stockholm, Vernouillet, both of France, assignors to Air Industrie, Courbevoie, France

Filed Nov. 6, 1975, Ser. No. 629,417
Claims priority, application France, Nov. 18, 1974, 74 37934
Int. Cl.[2] B05B *1/28*
U.S. Cl. 118—326 **6 Claims**



1. A process for purification of a gas laden with fine paint particles, comprising washing by a liquid in which the fine paint particles are non-miscible comprising passing the particle laden gas through the washing liquid, collecting the liquid which has washed the gas, and which is laden with fine particles in suspension, and dividing the washing liquid laden with fine particles into two streams of different flow rates, a first stream which is recycled to said washing step from the collection without undergoing substantial settling, and a second stream which is of a lesser flow rate than that of the first stream and which undergoes settling during which the particles in suspension are separated from the liquid itself, the second liquid now being cleaned, and combining and recycling the clean second liquid with the first recycled liquid to the washing step.

4,102,304

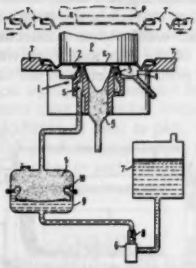
APPARATUS FOR APPLICATION OF SEALANT

Michael Debenham, Frankston, Australia, assignor to The Broken Hill Proprietary Company, Limited, Melbourne, Australia

Continuation of Ser. No. 466,057, May 1, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 697,844
Claims priority, application Australia, May 1, 1973, 3155/73
Int. Cl.[2] B05C *5/00*; B21D *51/46*
U.S. Cl. 118—421 **12 Claims**

1. Apparatus for applying substantially uniform amounts of sealant material to container members, said apparatus comprising a sealant transfer head and container member holding means for holding and aligning a container member over the transfer head, said transfer head including sealant transfer face means for continuously forming a meniscus of sealant during periods between sealant transfers, a part of the meniscus transferable to said container member, said face means and said meniscus having a configuration generally corresponding to the area of the container member that is to be covered by sealant, said transfer head also including sealant supply means opening to said face means for continuously supplying amounts of sealant thereto, said sealant transfer face means and said sealant supply means cooperating so that said sealant supply

means provides to said sealant transfer face means sealant in an amount which in the interval between successive sealant applications to the next container member exceeds the amount of sealant required to cover a given container member area, and said sealant on said transfer face means continuously forms said meniscus of sealant during periods between said sealant transfers, and excess sealant removal means for removing excess sealant by permitting the same to at least initially flow away



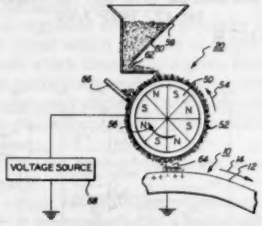
from said transfer face means to thereby leave a substantially uniform amount of sealant in the form of a meniscus of the transfer face means, said transfer head and said container member holding means cooperating to cause a container member to periodically contact said sealant meniscus in order to transfer a substantially uniform amount of sealant from said transfer head to said container member to cover said container member area with sealant.

4,102,305

DEVELOPMENT SYSTEM WITH ELECTRICAL FIELD GENERATING MEANS

William M. Schwarz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,216
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—651 **14 Claims**



1. An apparatus for developing a latent image with particles having the resistivity thereof varying as a function of the electrical field applied thereto, including:

means for depositing the particles on the latent image; and

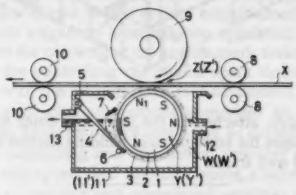
means for generating an electrical field between the latent image and said depositing means, said generating means forming a constant electrical field with an alternating electrical field superimposed thereover with the alternating electrical field having a peak amplitude sufficient to render the particles substantially conductive.

4,102,306

DEVELOPING ROLLER AND RINSING DEVICE

Tatsuo Ohta, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 10, 1977, Ser. No. 795,629
Claims priority, application Japan, May 31, 1976, 51-62401; May 31, 1976, 51-62402
Int. Cl.[2] G03G *21/00, 15/10, 15/09*
U.S. Cl. 118—658 **8 Claims**



1. In an electrophotographic apparatus, a device for developing or rinsing an electrostatic image bearing surface with a liquid at a contact zone wherein said liquid is brought into contact with said image bearing surface only at said zone, comprising:

at least one roller comprising a stationary magnetic member having a plurality of magnetic poles located at predetermined positions around periphery of said magnetic member, a non-magnetic cylindrical member surrounding said stationary magnetic member and adapted to rotate along the outer periphery of said magnetic member, and a magnetic brush of magnetic particles formed on the surface of the rotatable non-magnetic member for carrying the liquid to the contact zone;

an agitating plate located downstream of the contact zone and adjustably arranged at an interval from the roller for scraping the magnetic brush after it has been rotated past the contact zone to remove liquid from the surface of said magnetic brush;

a cutting blade located downstream of said agitating plate and arranged at an adjustable interval from the roller for adjusting the thickness of the magnetic brush; and

means for imbuing the adjusted portion of the magnetic brush with said liquid located downstream from said cutting blade so that liquid of substantially uniform concentration is brought into contact with the electrostatic image bearing surface at the contact zone by rotation of the non-magnetic member.

4,102,307

PORTABLE LIVESTOCK STALL

Richard D. Cusick, and Larry W. Wall, both of Wichita, Kans., assignors to Kansas Stall Company, Inc., Wichita, Kans.

Filed Sep. 13, 1976, Ser. No. 722,786
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—16 **8 Claims**

1. A portable livestock stall for installing on top of the ground surface, the stall comprising:

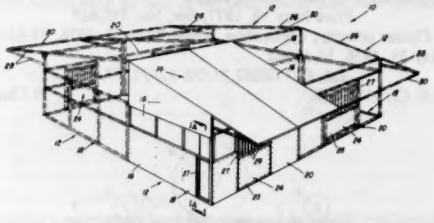
a pair of vertical, tubular, parallel side wall frames;

a vertical, tubular center wall frame;

a vertical, tubular front wall frame parallel to said center wall frame and having a door pivotally attached thereto;

a plurality of pins received in tubular sleeves attached to the ends of said wall frames for connecting together the ends of said side wall frames to the ends of said front wall frame and said center wall frame thereby forming a stall frame, said pins being of sufficient length for extending through said tubular sleeves adjacent the ground surface and into the ground surface for securing the stall thereto;

flexible padding disposed between the inner and outer sides of said wall frames; and



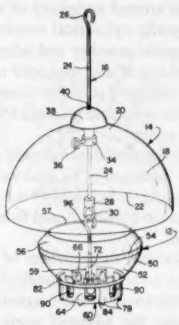
flexible fabric attached to the inner and outer sides of said wall frames for retaining said padding therein and enclosing said stall frame.

4,102,308

BIRD FEEDER

Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Foster, R.I.

Filed Sep. 8, 1976, Ser. No. 722,069
Int. Cl.[2] A01K *39/00*
U.S. Cl. 119—52 R **26 Claims**



18. A bird feeder and the like comprising a feed assembly including means for storing and dispensing feed, a protective outwardly flared hood member positioned thereabove and laterally terminating beyond the extent of said assembly, connection means for interconnecting and positioning said hood member and said feed assembly with respect to each other, said connection means including a relatively rigid primary rod passing through said hood and a second relatively rigid rod, the upper terminus of which is directly pivotally interconnected to said primary rod at the lower terminus thereof, said secondary rod further supporting said feed assembly for free swinging movement independent of movement of said hood.

4,102,309

BOILER FOR LIQUID OR GASEOUS FUELS

Hans Viessmann, Battenberg, Eder, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,534
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552388
Int. Cl.[2] F22B *7/00*
U.S. Cl. 122—136 R **6 Claims**

1. A water boiler comprising, in combination:

(a) a housing for holding the water to be boiled and comprised of

(1) a front wall,

(2) a rear wall,

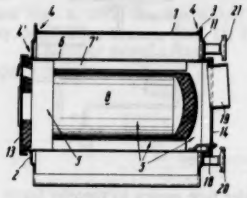
(3) a side wall extending between the front wall and the rear wall, the front and rear walls defining apertures surrounded by outwardly flaring edges, and

(4) external fillet weld seams connecting the side wall fluid-tightly to the front and rear walls,

(b) a tube mounted in the apertures of the front and rear walls, the tube defining outer and inner surfaces, the outer surface of the tube defining a water chamber with the housing, and the tube having opposite ends protruding, respectively, beyond the front and rear walls,

(1) the tube consisting of a sheet metal blank having two abutting edges extending the length of the tube,

(c) external fillet weld seams connecting the outwardly flaring edges of the rear and front wall apertures fluid-tightly to the protruding ends of the tube,



(d) circumferentially spaced and longitudinally extending sheet metal profiles affixed to the inner surface of the tube,

(e) an external, longitudinally extending weld seam fluid-tightly connecting the abutting edges of the sheet metal blank between two adjacent ones of the profiles,

(f) a housing defining a fuel combustion chamber mounted within the tube and surrounded by the sheet metal profiles, the combustion chamber being in communication with the sheet metal profiles whereby the profiles operate as flues for combustion gases generated in the combustion chamber,

(g) a fuel burner inlet arranged to burn fuel in the combustion chamber, and

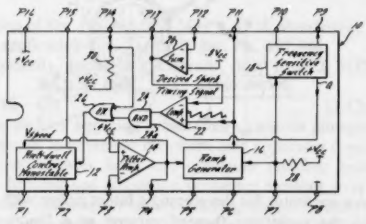
(h) a combustion gas discharge in communication with the flues for removing the combustion gases.

4,102,310

ELECTRONIC CIRCUIT FOR USE IN A VARIETY OF ENGINE CONTROL SYSTEMS

LaVerne A. Caron, Sterling Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 20, 1976, Ser. No. 752,493
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **17 Claims**



1. In an internal combustion engine, an electronic engine timing control circuit for providing control of an engine function comprising:

an output stage which is switched from one state to another state for producing an output signal;

an output terminal connected with said output stage at which said output signal is given;

a first input terminal receiving a variable frequency trigger signal representative of engine speed;

a second input terminal receiving a variable frequency trigger signal representative of engine speed;

a third input terminal receiving a desired timing signal derived from at least one parameter useful in controlling said engine function and representing desired timing of said output signal; and

circuit means coupling said three input terminals and said output stage such that the trigger signal at said first input terminal always causes said output stage to produce said output signal so long as said output stage is in its one state at the time that the effect of the trigger signal received at said first input terminal is felt by said output stage, and when the trigger signal at said second input terminal has a frequency greater than a selected frequency, the desired timing signal controls, at least in part, the time at which said output stage produces said output signal; and

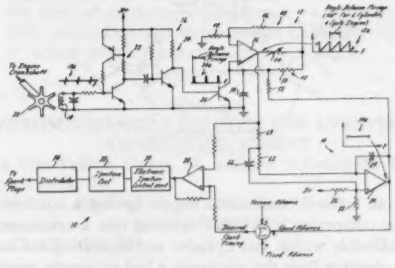
utilization means coupled to said output terminal for providing control of said engine function by said output signal.

4,102,311

CIRCUIT FOR GENERATING A SAWTOOTH ENGINE CRANK ANGLE SIGNAL AND AN ANALOG ENGINE SPEED SIGNAL

Frederick William Crall, Farmington; Lawrence William Tomczak, and LaVerne Andrew Caron, both of Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 30, 1975, Ser. No. 545,274
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **3 Claims**



1. In an electronic engine spark timing controller for controlling the timing of spark ignition in an internal combustion engine, the combination comprising:

a closed-loop regulated sawtooth generator comprising an integrator circuit which provides an output signal having a magnitude which changes as a given linear function of time and is periodically reset to an initial value at predetermined engine crank angles to thereby develop a sawtooth waveform whose frequency is representative of the speed of the engine;

a comparator circuit having input circuit means and output circuit means;

a reference circuit for providing a reference signal whose magnitude is representative of a magnitude of said sawtooth waveform which is desired immediately prior to the resetting of said integrator circuit;

means operatively coupling said reference and integrator circuits to the input circuit means of said comparator circuit so that said reference signal and said sawtooth waveform may be compared by said comparator circuit, said comparator circuit including means for providing at its output circuit means an adjustment signal whose magnitude is a function of the comparison between said reference signal and the actual magnitude of said sawtooth waveform immediately prior to the resetting of said integrator circuit, and means operatively coupled with the output circuit means of said comparator circuit for feeding back said said adjustment signal to said integrator circuit to cause the actual magnitude of said sawtooth waveform immediately prior to resetting of said integrator circuit to be closed-loop regulated to said desired magnitude thereof over a range of engine operating speeds;

an adjustable calibration element operatively coupled in said integrator circuit for adjusting the gain thereof to cause the magnitude of said adjustment signal to bear a desired relationship to the frequency of said sawtooth waveform without affecting the linearity of the output signal of said integrator circuit or said desired magnitude to which said sawtooth waveform is closed-loop regulated;

and means for controlling the engine spark timing including means for controlling the engine spark timing in accordance with the magnitude of said adjustment signal;

wherein said integrator circuit comprises an operational amplifier having a pair of inputs and an output, a coupling circuit connecting said operational amplifier output with one of said operational amplifier inputs, a second coupling circuit connecting said operational amplifier output with the other of said operational amplifier inputs, said adjustable calibration element being connected in common with both said coupling circuits, and

a capacitor operatively connected in one of said coupling circuits and arranged so that the charging rate thereof controls the rate of change of the output signal of said integrator circuit, and

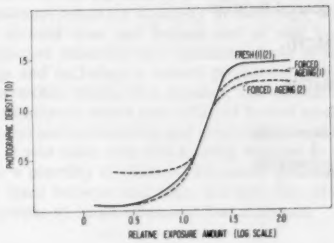
wherein said comparator circuit includes an operational amplifier and a resistor connected in the output thereof to provide an adjustable current source which produces said adjustment signal.

4,102,312

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIALS

Kenji Sashihara, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 30, 1975, Ser. No. 627,315
Int. Cl.[2] G03C *1/02, 1/00, 3/00, 1/30*
U.S. Cl. 96—114.1 **12 Claims**



1. In a thermally developable light-sensitive material comprising a support having thereon at least one layer containing at least (1) an organic silver salt, (b) a light-sensitive silver halide or a component capable of forming a light-sensitive silver halide and (c) a reducing agent, the improvement which comprises the material further comprising (d)(i) a palladium-containing compound in at least one layer provided on the support or (d)(ii) a palladium-containing compound in the support, wherein said palladium-containing compound is present in an amount of about 10^{-8} to about 10^{-2} mole per mole of the organic silver salt, and, said palladium-containing compound has the general formula:

$$Pd\ (R_1COCHCOR_2)_2$$

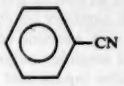
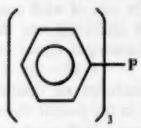
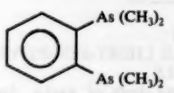
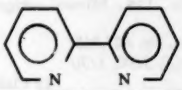
wherein R_1 and R_2 have the following meaning:

R_1	R_2
C_6H_5	C_6H_5
C_6H_5	CH_3
CH_3	CH_3
CF_3	CH_3

or has the general formula:

L_2PdX_2

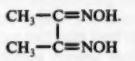
wherein L and X have the following meaning:

L	X
$C_6H_5CH_2SCH_2C_6H_5$	Cl
	Cl
$CH_2{=}CHCN$	Cl
	Cl
$(C_2H_5)_3P$	Br
	I
	Cl

or has the general formula:

$Pd(DMGH)_2$

wherein DMGH:



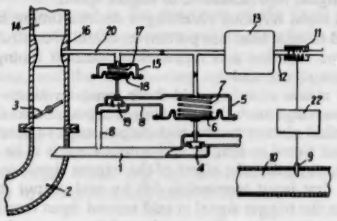
4,102,313

DEVICE FOR THE REGULATION OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

Bernard R. Laprade; Xavier J. Laprade, both of Arudy, and Pierre J. Gele, 3, rue Vaussenat, Tarbes, all of France

Filed Jun. 15, 1976, Ser. No. 696,189
Claims priority, application France, Jun. 18, 1975, 75 19077
Int. Cl.[2] F02M 7/20
U.S. Cl. 123—119 EC 7 Claims

1. A device for the regulation of the air-fuel mixture of internal combustion engines comprising a gas inlet opening into the inlet manifold downstream of the throttle valve for the control of the air flow, said gas inlet being controlled by a valve controlled by a capsule comprising a movable member held by an elastic return device, said movable member being subject to the partial vacuum prevailing in the manifold, the partial vacuum being itself modulated firstly as a function of the air flowrate in the inlet pipe and secondly as a function of the composition of the exhaust gases by an electromagnetic



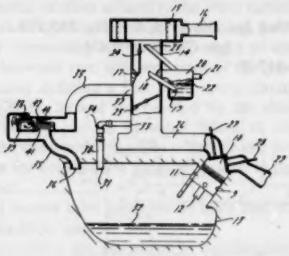
valve arranged in a pipe connecting the capsule to the atmosphere.

4,102,314

CRANKCASE VENTILATION

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 30, 1977, Ser. No. 782,671
Int. Cl.[2] F02F 9/00
U.S. Cl. 123—119 B 6 Claims



1. In an internal combustion engine having a combustion chamber comprising a cylinder opening into a crankcase, a piston movable within said cylinder and separating the combustion chamber from the crankcase, a fuel-air supply conduit, throttle means in said conduit, means for effecting a mixture of fuel and air in a predetermined ratio in said conduit upstream of said throttle means, and means for connecting said conduit downstream of said throttle means with said combustion chamber for supplying said mixture thereto, the combination of means for recirculating piston blow-by gases from said crankcase into said supply conduit at approximately said predetermined ratio of fuel and air comprising first conduit means for connecting said crankcase with said supply conduit at a location downstream of said throttle means, and second conduit means connecting said crankcase with said supply conduit at a location upstream of said throttle means for supplying said mixture to said crankcase whenever the pressure in the latter is less than the pressure upstream of said throttle means.

4,102,315

PROPORTIONAL CONTROLLER FOR CONTROLLING AIR FLOW TO AN ENGINE

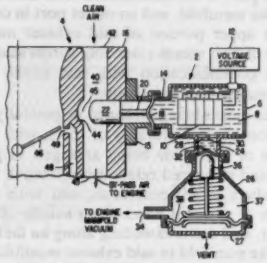
Magdi M. Fahim, Rochester, Mich., and William D. Marscher, Coventry, Conn., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 14, 1977, Ser. No. 759,309
Int. Cl.[2] F02M 23/04, 23/10
U.S. Cl. 123—124 B 10 Claims

1. A proportional controller for controlling air flow to an

engine during engine start-up and warm-up periods, comprising:

valve means including a valve member positioned in an engine air flow channel in cooperative relation therewith to provide an air flow control orifice, the valve position initially dependent upon the volume of a thermoexpansive and incompressible material sensitive to ambient temperature conditions, with the orifice area and air flow thereupon being at a maximum;



first means responsive to engine manifold vacuum during the engine start-up period for displacing the valve in the channel to reduce the orifice area and the flow of air after the engine starts, said first means displacing said valve by acting on said thermoexpansive material; and

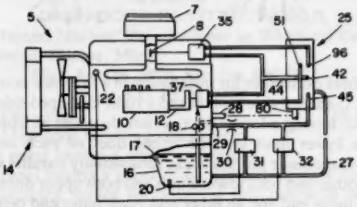
second means in cooperative relation with the valve means for displacing the valve member in the channel during engine warm-up to ultimately close the orifice and block the flow of air through the channel when the engine is fully warmed up, said second means displacing said valve by acting on said thermoexpansive material.

4,102,316

HYDROMECHANICAL SHUTOFF FOR AN INTERNAL COMBUSTION ENGINE

Gary Glen Valbert, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,632
Int. Cl.² F02B 77/08
U.S. Cl. 123—198 DB **27 Claims**



1. In an internal combustion engine having fuel shutoff means and air shutoff means each operable for respectively blocking fuel and air supply to the engine, the engine further having a pressurized lubrication system and a liquid coolant system; an engine shutoff device comprising:

a housing;

an unpressurized source of fluid;

engine driven fluid pump means mounted in said housing for pressurizing said fluid;

the housing defining first circuit passage means for communicating pressurized fluid from the engine driven pump means to the source;

first valve means interposed in said first circuit passage means and operably responsive to engine oil pressure for allowing communication of pressurized fluid from said engine driven pump means to said source while said engine oil pressure is greater than a first predetermined pressure;

second valve means also interposed in said first circuit passage means in a parallel arrangement with said first valve means and operably responsive to engine oil pressure for allowing communication of pressurized fluid from said engine driven pump to said source while said engine pressure is greater than a second predetermined pressure, the second predetermined pressure being greater than said first predetermined pressure; and,

fuel lock means responsive to pressure in said first circuit passage means for operating the fuel shutoff means to block fuel to said engine.

4,102,317

APPARATUS FOR IGNITING CHARCOAL BRIQUETTES

John R. Shonnard, 5 Wells La., East Setauket, N.Y. 11733, and Rocco J. Natale, 57 Glenwood Dr., Hauppauge, N.Y. 11787

Filed Feb. 16, 1977, Ser. No. 769,407
Int. Cl.² F24B 3/00
U.S. Cl. 126—25 B **9 Claims**

1. Apparatus for igniting charcoal briquettes or similar fuels, comprising:

a frame member comprising a right and a left vertical bracket each of an "L" shaped configuration with the inverted top ends of said "L"s facing each other; a plurality of spaced rings, each of said spaced rings secured to said brackets and transverse to said brackets to form a longitudinal tubular housing member, a smaller ring positioned at said top end of said housing, said smaller ring secured to said top ends of said right and left brackets and positioned relatively coaxially to said rings; a horizontal bar located near said bottom end of said housing and positioned relatively on a diameter of one of said spaced rings and including a central projection on said bar, a combustible tubular flue member, said tubular flue member positioned within and encircled by said smaller ring at one end and surrounding said projection of said horizontal bar at said other end, said housing adapted to accommodate a plurality of charcoal briquettes positioned within the space between said rings and said flue, to cause said briquettes to ignite when said flue is burned.

4,102,318

STRATIFIED COMBUSTION FURNACE

Paul W. Runquist, 1030 Neil Creek Rd., Ashland, Oreg. 97520

Filed Nov. 4, 1976, Ser. No. 738,733
Int. Cl.² F24H 3/10
U.S. Cl. 126—103 **6 Claims**

1. A plural stage, log burning, down draft heating apparatus for heating and delivering clean air to enclosed areas of a building comprising, in combination,

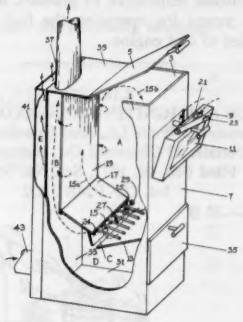
(a) a primary combustion chamber of generally uniform rectangular horizontal cross-section through which solid fuel, such as logs, and air may be supplied for the purpose of combustion, and having an outlet substantially narrowed in one horizontal dimension only for the products of combustion at its lower extremity,

(b) a grate of much smaller width than the unreduced horizontal width of the primary combustion chamber, dis-

posed across said outlet, through which grate embers of restricted size and most of the gaseous products of combustion are required to pass downward,

(c) convergent means in said combustion chamber for funneling solid fuel onto the grate,

(d) means located beneath the grate for intercepting embers that fall through the grate and detaining them until they have been burned down to much smaller dimensions than the maximum that can be passed by the grate, so that a secondary down draft combustion chamber is provided,



(e) a bottom receptacle communicating with said secondary combustion chamber for the reception and accumulation of ashes and the transmission of the gaseous products of combustion, and

(f) upwardly extending gas discharge means communicating with the bottom receptacle and extending above the down draft heating apparatus for inducing the gaseous products of combustion to flow downward through the primary and secondary combustion chambers into said bottom receptacle and for discharging them thence upward into the atmosphere.

4,102,319

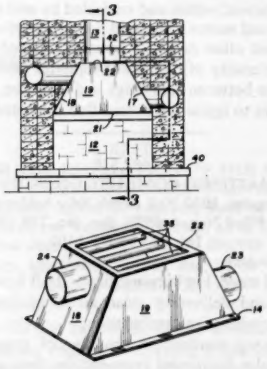
FIREPLACE ROOM HEATER

Linus J. Koopmeiners, St. Cloud, Minn., assignor to The Gran-A-Stone Company, St. Cloud, Minn.

Filed Nov. 15, 1976, Ser. No. 741,709

Int. Cl.[2] F24B 7/04

U.S. Cl. 126—121 **2 Claims**



1. Fireplace room heater means comprising:

(a) a generally pyramidal hooded shell member adapted to be mounted in a fireplace flue, said shell member comprising an outer front wall, an outer rear wall and first and second side walls each sloping inwardly and upwardly to define a generally rectangular open bottom and a generally rectangular open top of a smaller perimeter than that of said open bottom and a pair of inner walls including an inner front wall and an inner rear wall, said inner front wall being generally parallel to and spaced apart from said outer front wall to form an intake air manifold therebetween, said inner rear wall being generally parallel to and spaced apart from said outer rear wall to form an exhaust air manifold therebetween, said inner walls being spaced apart from one another to define a flue zone thereacross;

(b) an inlet port in communication with the base portion of said intake manifold, and an outlet port in communication with the upper portion of said exhaust manifold, and a plurality of duct means extending across said flue zone and being in communication with said intake manifold and exhaust manifold respectively;

(c) said duct means being arranged in generally axially parallel relationship in a plurality of rows, with the individual members of each row being arranged in predetermined stacked and staggered relationship relative to the individual members in adjacent rows, and with the individual members in adjacent rows being axially offset, one from the other, said ducts extending along an inclined axis from said intake manifold to said exhaust manifold, and with the duct axis of the ducts of each individual row being spaced apart vertically a distance generally equal to twice the outer duct diameter; and

(d) a top row of ducts extending across and coupling the upper portion of said manifolds, one to the other, and with the duct axis of the ducts of said top row being offset from the duct axis of the ducts of the next adjacent row.

4,102,320

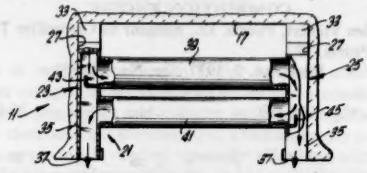
FIREPLACE HEAT EXCHANGER

Anthony Mastropole, East Meredith, N.Y. 13757

Filed May 13, 1977, Ser. No. 796,692

Int. Cl.[2] F24B 7/04

U.S. Cl. 126—121 **10 Claims**



1. A heat exchanger for installation in a fireplace comprising:

a left U-shaped side section and a right U-shaped side section each having a lower duct, a riser duct and an upper duct, the lower duct and the upper duct of each respective U-shaped side section being substantially parallel with one another and both lower ducts and both upper ducts having an outer end and an inner end, each outer end being open, each riser duct being inclined generally upwardedly, and being connected at its upper end to the inner end of its respective upper duct and at its lower end to the inner end of its respective lower duct, said left and right U-shaped sections being spaced apart to permit a source of heat to be placed between the two U-shaped side sections;

a rear horizontal duct connected at one end to the upper duct of the left U-shaped side section adjacent the inner end of the upper duct and at the other end to the upper duct of the right U-shaped side section adjacent to the inner end of the upper duct;

a forward horizontal duct located adjacent the rear horizontal duct toward the open ends of said upper duct and lower duct and being connected at one end to the upper duct of the left U-shaped side section and at the other end to the upper duct of the right U-shaped side section; and

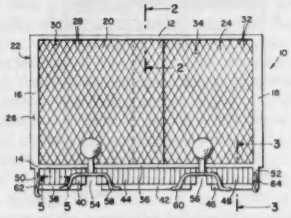
baffle means for deflecting air from the left U-shaped side section and the right U-shaped side section into the rear horizontal duct and the forward horizontal duct.

4,102,321

FIREPLACE SCREEN

Norman Githens, 8 Dolphin Dr., Massapequa, N.Y. 11758

Filed Mar. 2, 1977, Ser. No. 773,598
Int. Cl.[2] F24C *15/12*
U.S. Cl. 126—140 **5 Claims**



1. A fireplace screen adapted to fit over an opening of a fireplace to be in front of a fuel burning space thereof comprising:

a rigid supportive frame having front and rear face portions and including rigid top, bottom and opposite-side channel members fixedly connected to one another;

a first solid rigid sheet fixedly secured to said rigid supportive frame intermediate said front face portion and said rear face portion;

a second solid rigid sheet slidably affixed to said frame intermediate said front face portion and said rear face portion;

means to removably secure said rear face portion to a ferromagnetic material bordering said opening of said fireplace; and

at least three foldable accordian-like members slidably affixed to said bottom channel member, said at least three members extensible in length providing a pair of passageways when partially fully extended and providing a substantially continuous uninterrupted surface when fully extended.

4,102,322

OVEN DOOR CONSTRUCTION

John T. Doner, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 16, 1976, Ser. No. 696,532
Int. Cl.[2] F23M *7/04*
U.S. Cl. 126—198 **19 Claims**

1. An oven door structure comprising:

a front panel having a window opening;

a rear panel having a rearwardly recessed window opening;

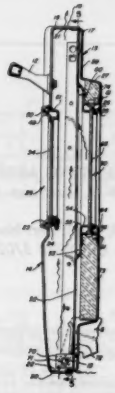
panel securing means for securing said panels in parallel spaced relationship with said window openings aligned and defining an air flow space therebetween;

means for providing a cooling air flow through said space; a front viewing panel assembly having a front light transmitting viewing panel;

front viewing panel assembly securing means removably swingably mounting said front viewing panel assembly to said front panel to cause said front viewing panel to extend across said front panel window opening, said front viewing panel assembly having frame means extending rearwardly into said space;

a rear viewing panel assembly having a rear light transmitting viewing panel; and

rear viewing panel assembly securing means for readily removably securing said rear viewing panel assembly to said rear panel to extend across said rearwardly recessed rear panel window opening, said front viewing panel assembly frame means being spaced fully forwardly of said rear viewing panel assembly whereby said air flow space is effectively unobstructed between said frame means and said rear viewing panel assembly, said frame means defining means for causing a portion of the cooling



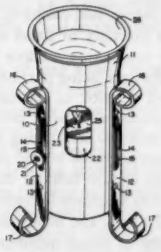
air flow to be deflected rearwardly to the recessed rear viewing panel for effective cooling of the rear viewing panel assembly notwithstanding the recessed disposition thereof, the air flow space having substantially maximum width between said viewing panels.

4,102,323

HEATER FOR BUTTER AND THE LIKE

Peter G. Pritz, c/o Trico Non Ferrous Metal Products, Inc., Wyandotte Rd., Willow Grove, Pa. 19090

Filed Dec. 12, 1977, Ser. No. 859,691
Int. Cl.[2] A47G *23/04*
U.S. Cl. 126—261 **5 Claims**



1. A heater for a receptacle whose contents are to be heated comprising

a hollow vertical cylindrical housing having a wall with a flaring upper wall portion for the support thereon of the receptacle and a lower wall portion,

a plurality of vertical strips secured to said housing wall and having lower leg portions extending below and outwardly with respect to the lower portion of said housing wall and at least one of said strips having a handle means extending outwardly from its upper end and contiguous to said upper wall portion,

a shelf within said housing having a mounting bracket secured thereto,

a heating member supported on said shelf, and members for controlling the positioning of said shelf comprising

a threaded stud carried by said mounting bracking and

extending through an upwardly extending slot in said housing wall, and

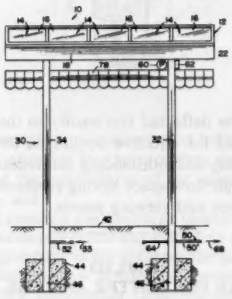
a nut on said stud for clamping said shelf at a desired position of vertical adjustment.

4,102,324

SOLAR HEATING ASSEMBLY

Oliver E. Netherton, 119 N. Arcturas Ave., Clearwater, Fla. 33515

Filed Jul. 23, 1976, Ser. No. 708,213
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



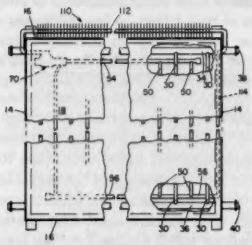
1. A solar heating assembly of the type primarily used to heat fluid from solar radiant energy and utilized in combination with brace means of the type adapted for attachment to a predetermined surface, said combination comprising: a collector assembly including a casing and a fluid conduit means disposed within said casing, said casing including an inner wall surface defined by a plurality of panel members disposed in substantially angular orientation relative to one another, said casing further comprising a facing portion disposed to define a substantially enclosed interior of the casing relative to the plurality of panel members; conduit connection means connected substantially adjacent said facing portion and disposed to extend into the interior space of said casing, said fluid conduit means connected to said conduit connection means and disposed in substantially suspended relation therefrom into the interior space of said casing and in spaced apart relation from each of said plurality of panel members; said brace means comprising a plurality of support columns disposed in laterally spaced relation from one another, said brace means connected in supporting relation to said casing and said support columns disposed at least in part between said casing and the predetermined surface on which said brace means are mounted; and an interconnecting conduit disposed in interconnecting fluid communicating relation between said fluid conduit means within said casing at a point of delivery of the heated fluid, at least one of said support columns having a substantially hollow interior configuration extended along at least a portion of its length, said interconnecting conduit disposed on the interior of said one support column for at least a portion of its length, whereby the rise in temperature within said casing is caused by exposure of said fluid conduit means to solar radiant energy causing the heating of fluid within said fluid conduit means mounted within said casing and disposed in predetermined relation to a supporting surface by said support columns.

4,102,325

TEMPERATURE CONTROL IN SOLAR-TO-THERMAL ENERGY CONVERTERS

Richard D. Cummings, Reading, Mass., assignor to Daystar Corporation, Burlington, Mass.

Filed May 4, 1977, Ser. No. 793,495
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **13 Claims**



1. In a solar-to-thermal energy converter comprising an insulating frame, a solar energy absorber mounted in said frame, fluid flow heat exchange means thermally coupled to said absorber to carry away as thermal energy the absorbed solar energy, and a window transmissive to solar energy mounted in said frame above said absorber, that improvement consisting of a temperature actuated heat loss enhancer comprising

fluid flow heat pickup means thermally coupled to said absorber,

an exterior heat rejector element,

fluid flow heat rejection means thermally coupled to said element, and

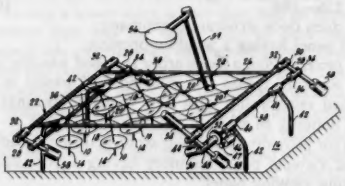
a thermally actuated valve connected between said pickup and rejection means to form a fluid flow circuit separate from said fluid flow heat exchange means and powered by heat-produced differential buoyancy forces of the fluid therein when said valve is open.

4,102,326

CENTRAL RECEIVER SOLAR COLLECTOR USING MECHANICALLY LINKED MIRRORS

Warren T. Sommer, 2608 N. Humboldt Blvd., Milwaukee, Wis. 53212

Filed Sep. 28, 1977, Ser. No. 837,181
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **19 Claims**



1. A solar radiation collector utilizing mechanically linked mirrors to provide radiation concentration, comprising:

(a) a radiation receiver,

(b) a first rigid structure substantially greater in dimensional extent in at least one dimension than the dimentions of the radiation receiver, the first rigid structure being generally fixed with respect to the radiation receiver at a position displaced from the radiation receiver along a line normal to the directions of major dimensional extent of the first rigid structure,

(c) a first plurality of articulated joints carried by the first rigid structure, the joints allowing free rotation in any direction within a substantial range of angular positions,

(d) a plurality of mirrors, each mirror being coupled to and rotatable about an individual joint of the first plurality of articulated joints so that, when properly oriented, each of the mirrors may reflect radiation from a radiation source onto the radiation receiver,

(e) a second rigid structure which is translatably movable in three mutually perpendicular directions with respect to the first rigid structure, with the motion being constrained so that each point on the second rigid structure generally moves over a spherical surface particular to that point,

(f) a plurality of positional guides carried by the second rigid structure, each individual positional guide being paired with an individual joint of the first plurality of articulated joints in that each positional guide is disposed with respect to the second rigid structure in such a way that the particular spherical surface to which a positional guide is constrained contains an articulated joint of the first plurality of joints, with the articulated joint positioned at the intersection with the spherical surface of a straight line which passes through the position of the radiation receiver and the center of the particular sphere of constraint,

(g) a plurality of linear guide members, each coupled to an individual articulated joint of the first plurality of joints and extending to the positional guide associated with that particular joint, with the positional guide slidably engaging the linear guide member and with each linear guide member adapted to orient the individual mirror associated with that particular joint to a position normal to the linear guide member, and

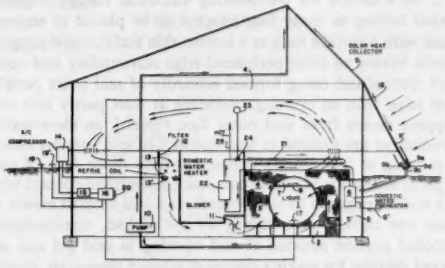
(h) means for moving the second rigid structure, in response to changes in the angular position of the sun, so that each positional guide lies along a line which passes through the center of the particular sphere of constraint for that positional guide and is aligned in the direction of the sun.

4,102,327

SOLAR HEATING (COOLING) SYSTEM

Harry E. Thomason, 6802 Walker Mill Rd., SE., Washington, D.C. 20027

Filed Sep. 18, 1973, Ser. No. 398,323
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **5 Claims**



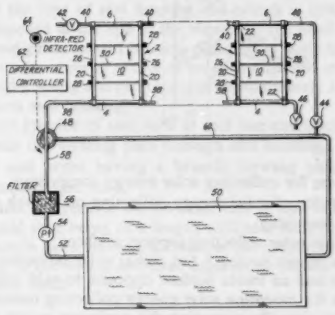
1. Combination heat storage (cold storage) and auxiliary heating apparatus comprising a container having liquid space adjacent to the bottom for heat storage and an air space adjacent to the top for auxiliary heat, means between said liquid space and said air space substantially separating said spaces, means for circulating liquid from said liquid space to a source of heat for warming and back to said liquid space for storage, means for supplying auxiliary heat to said air space to supplement stored heat from said liquid space, and means to channel air to be heated to an area adjacent to the bottom of said container and up around said container for preheating said air and adjacent to the top of said container for adding heat to said air by said auxiliary heat means.

4,102,328

SOLAR HEATING AND CONTROL SYSTEM

John E. Stiff, 3111 S. Valley View, Las Vegas, Nev. 89102

Filed Aug. 2, 1976, Ser. No. 710,799
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **4 Claims**



1. A solar energy collector panel array, each panel comprising:

a tubular inlet header and a tubular outlet header, said headers being arranged in spaced parallel relation and each having a longitudinal slot in the side thereof facing the other header, said slots being of less length than said headers and terminating inwardly of the ends thereof;

a generally planar matrix panel comprising spaced parallel sheets, one of which is black and the other of which is clear and a multiplicity of parallel partitions extending between said sheets to define adjacent flow channels having open ends at opposite ends of said matrix panel, the width of said matrix panel transverse to said flow channels being substantially equal to the length of said slots in said headers;

said opposite ends of said matrix panel extending through said slots in respective headers and being sealed thereto and said flow channels being free of constrictions to provide unobstructed communication between the interiors of said inlet and outlet headers;

said array of panels being arranged with panels in side-by-side relation, first conduit means interconnecting adjacent unslotted ends of said inlet headers, second conduit means interconnecting adjacent unslotted ends of said outlet headers, and pump means for circulating a heat absorbing fluid medium from a supply thereof to said inlet headers, through said flow channels to said outlet headers and back to said supply;

means for selectively directing said medium from said pump means to said inlet headers or directly back to said supply;

means for sensing the intensity of infrared radiation in the vicinity of said array of panels and providing a first signal proportional to said intensity;

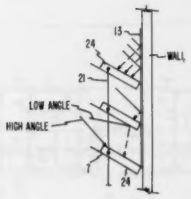
means for sensing the temperature of said medium in said supply and providing a second signal proportional to said temperature; and

means for comparing said first and second signals and for controlling said valve means to direct medium from said pump means to said inlet headers only when said infrared radiation is sufficient to further heat said medium from said supply.

4,102,329
SYSTEM FOR COLLECTING SOLAR ENERGY

Arthur V. Smith, Jr., 6525 Independence St., Arvada, Colo. 80004

Filed Mar. 24, 1977, Ser. No. 780,769
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 17 Claims

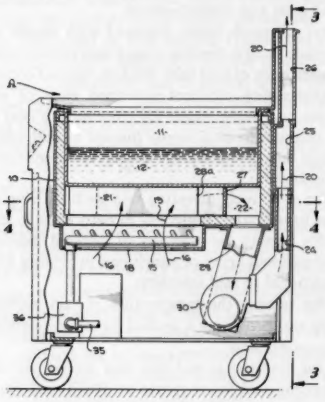


1. A system for collecting solar energy comprising:
(a) a plurality of solar energy collecting units each of said units comprising;
a flat planar solar reflecting support surface,
enclosure means having a flat planar solar reflecting outer surface and an inside surface opposite to said reflecting surface for mounting solar energy collecting means,
means for pivotally mounting the enclosure means to the support surface for rotation with respect to said support surface about a pivotal axis,
solar energy collecting means mounted within said enclosure means between said inside surface and said support surface for collecting solar energy,
(b) whereby said solar energy collecting units can be mounted to a structure side by side such that each enclosure means can be positioned such that the collector means are enclosed and protected or can be rotated about its pivotal axis for aligning its collecting means to direct sunlight and to reflected sunlight from the support surface and from the outer reflecting surface of the enclosure means on an adjacent unit.

4,102,330
LIQUID VAT HEATING APPARATUS

Donald D. Hutchinson, 229 Montreal, Playa del Rey, Calif. 90291

Continuation of Ser. No. 685,693, May 12, 1976, abandoned.
This application Sep. 26, 1977, Ser. No. 836,294
Int. Cl.[2] A47J 27/00
U.S. Cl. 126—374 6 Claims

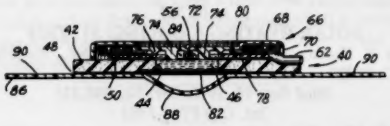


1. A heating apparatus including
a vat filled with liquid that is to be heated;
a combustion chamber including a housing disposed at least partially beneath the vat in thermal communication therewith;
a gas burner disposed within the combustion chamber;
the chamber housing having air inlet means cooperating with and below the elevation of the burner for supplying fresh air thereto and an exhaust passageway coupled to the combustion chamber for conducting therefrom substantially all of the heated air and combustion products generated by the burner;
and means for selectively turning the burner on and off;
said exhaust passageway including a first portion in direct communication with and extending downwardly from said combustion chamber to an elevation lower than the lowest elevation of said chamber, and a second portion if direct communication with said first portion at said lowest elevation thereof below said chamber and extending upwardly to an elevation higher than said gas burner;
a blower fan operatively connected to said combustion chamber and operable for moving the heated air and combustion products in said combustion chamber through said exhaust passageway; and
control means coupled to said burner and to said blower fan and cooperable with said selective on-off means for turning off said blower fan whenever said gas burner is turned off.

4,102,331
DEVICE FOR TRANSMITTING ELECTRICAL ENERGY

Joseph Grayzel, Englewood, and William Terrell, Scotch Plains, both of N.J., assignors to Datascope Corporation, Paramus, N.J.

Filed Sep. 21, 1976, Ser. No. 725,326
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.1 E 16 Claims

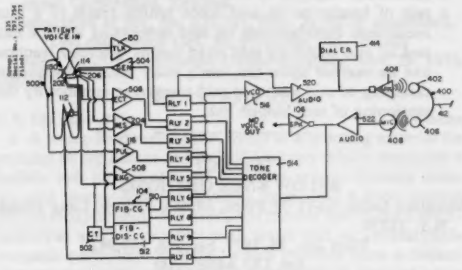


1. In a device for transmitting electrical energy, support means having an outer face adapted to be placed in engagement with a surface such as a human skin surface, said support means having an outer peripheral edge surrounding said outer face thereof and being formed inwardly of said outer peripheral edge with an opening extending at least partly into said support means from said outer face thereof, an electrically-conductive gel situated in said opening of said support means and being at least partly exposed at said outer face of said support means for engaging and making electrical contact with the surface engaged by said outer face of said support means, at least one carbon yarn having an unattached, non-insulated, exposed portion situated at said opening in said gel and engaged thereby for making electrical contact therewith, electrical insulation means covering said carbon yarn at the region of the non-insulated portion thereof situated in said gel, said insulation means being fixed to and carried by said support means for supporting said carbon yarn through said insulation means while protecting said carbon yarn from mechanical stresses, said yarn together with said insulation means having a length sufficiently great to extend through a substantial distance beyond said support means, and said carbon yarn carrying at an end portion distant from said portion in said gel a contact means for making electrical contact with an electrical instrument or the like, said contact means being situated next to an end of said insulation means which is distant from said non-insulated portion of said carbon yarn.

4,102,332
REMOTE, TELEPHONIC CARDIAC RESUSCITATION DEVICE

Lawrence J. Gessman, 21 Sabine Ave., Narberth, Pa. 19072

Filed May 17, 1977, Ser. No. 797,754
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—2.1 A 24 Claims



18. A remote, telephonic, cardiac resuscitation apparatus comprising a portable, patient-operatable portion and a remote physician-operatable portion, said physician operatable portion comprising:

(a) an acoustic telephone coupler;

(b) means for decoding physiological data received in the form of a variable pitch from said acoustic coupler;

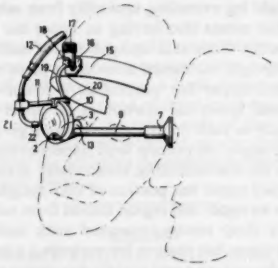
(c) means for displaying said data to said physician; and

(d) means for transmitting coded tones to said acoustic coupler for selecting the physiologic data to be collected by said patient operatable portion, and for providing commands to said patient operatable portion to treat said patient.

4,102,333
HEAD MOUNTED LAMP WITH JOINT OBSERVATION EYEPIECE

Karl Storz, Auf dem Schildrain 29, 7200 Tuttlingen, Fed. Rep. of Germany

Continuation of Ser. No. 615,789, Sep. 22, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,017
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2530939
Int. Cl.[2] A61B 1/06
U.S. Cl. 128—6 2 Claims



1. A head mounted lamp with joint observation eyepiece comprising

(a) a head band arranged for removable support on a person's head,

(b) a depending support secured on said head band for universal adjustment,

(c) a mirror,

(d) a prism,

(e) an elongated housing having a mounting support provided at the forward end thereof,

(f) said mirror positioned within said mounting support,

(g) means securing said mounting support on a lower portion of said depending support for locating said mounting support and housing below said head band adjacent to one eye of the wearer,

(h) lighting means on said depending support for illuminating said mirror,

(i) means defining a single viewing passageway through said housing and mirror providing a viewing path which opens at the rear of said housing and which is arranged to be disposed at the eye of the wearer of the head band,

(j) said prism in said housing disposed in said viewing path,

(k) a tube secured at one of its ends adjacent to the end of said housing and projecting at approximately a right angle from said housing,

(l) the interior of said tube at said one end communicating with the viewing path through said housing,

(m) said prism having a branch viewing path extending through said tube,

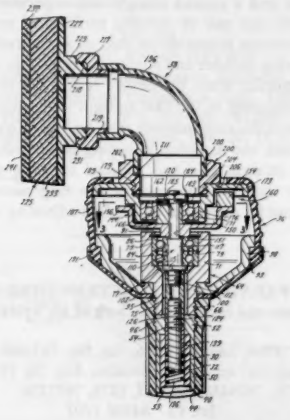
(n) and an eyepiece on the other end of said tube,

(o) said tube being of a length sufficient such that a second person has a viewing location at the eyepiece on said tube out of the way of and at an angle to the person wearing the head band.

4,102,334
MASSAGE UNIT

Thomas Peter Muchisky, 12153 Queen's Charter Ct., Creve Coeur, Mo. 63141

Filed Dec. 14, 1976, Ser. No. 750,507
Int. Cl.[2] A61H 1/00
U.S. Cl. 128—36 7 Claims



1. A massage apparatus operable by a human for therapeutic application to a patient comprising:

(a) a base section having a portion to be gripped by the human;

(b) a member mounted eccentrically on the base for eccentric rotation while the grippable base section portion is stationary;

(c) drive linkage extending through the grippable portion and engaged with the eccentric member to rotate the eccentric member while the base is stationary;

(d) an application surface to be applied to the body of the patient;

(e) an elbow member having a first end connected to the eccentric member for orbital movement of said first end, and a second offset end connected to the application surface to revolve the application surface by orbital move-

ment of said first end while the grippable portion is stationary.

4,102,335

MALE POTENCY DEVICE

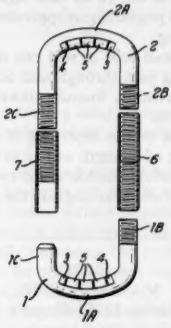
Robert John Woodward, 29 Calfside, Cheam, Surrey, and Walter O'Connell, 63 Garden Ave., Mitcham, Surrey, both of England

Filed Dec. 28, 1976, Ser. No. 755,072

Claims priority, application United Kingdom, Dec. 30, 1975, 53156/75

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—68.1 **17 Claims**



1. A male potency device, comprising a ring member adapted to surround the male genitalia and comprising a first straight side and a second straight side separated by curved sides, at least one pair of metallic surfaces of metals having different electrode potentials located on an internal circumference of the ring member and adapted to remain in contact with the male genitalia when the device is worn, a first adjusting means incorporated in the first straight side whereby the circumference of the ring member may be varied by a predetermined amount, and a second adjusting means incorporated in the second straight side and adapted to bring about a like variation in the circumference of the ring member to that brought about by operation of the first adjusting means.

4,102,336

APPARATUS FOR TRACTION THERAPY

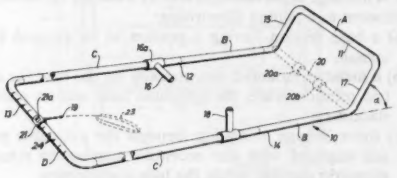
Ingrid Wiener, and Hans Wiener, both of 13, Rystavägen, Täby, Sweden

Filed Aug. 26, 1976, Ser. No. 717,608

Claims priority, application Sweden, Aug. 26, 1975, 7509452; Aug. 26, 1975, 7509453; Jun. 23, 1976, 7607276

Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—75 **16 Claims**



1. An exercising apparatus for the application of traction to the body of a user, comprising:

a rigid frame adapted to slide on a generally horizontal supporting surface, said frame having a pair of parallel limbs interconnected by at least one transverse member and separated by a distance greater than the width of the user's body;

strap means engageable with the user's body;

fastening means for securing said strap means to said frame, said fastening means including a looped link and a sleeve slidably surrounding said transverse member, said sleeve being longitudinally split between a pair of confronting formations engaged by said looped link; and

a pair of handgrips on said limbs within reach of a user recumbent therebetween on said supporting surface and tied to said frame by said strap means whereby traction can be exerted upon the user's body with simultaneous clamping of said sleeve to said transverse member by the tensioning of said looped link.

4,102,337

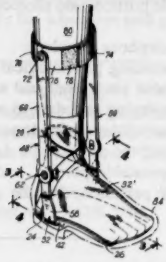
BELOW KNEE ORTHOSIS

Salvatore Golia, 63-71 77 Place, Middle Village, Long Island, N.Y. 11379

Filed Jan. 26, 1977, Ser. No. 765,942

Int. Cl.[2] A61F *3/00*

U.S. Cl. 128—80 E **9 Claims**



1. A brace comprising foot plate means having a front toe region, a rear heel region, and an intermediate arch region, said foot plate means having an upper surface adapted to be situated beneath a foot, and said foot plate means being formed with at least one transverse slot situated beneath said upper surface and extending inwardly from a side of said foot plate means at a location situated at the rear of said intermediate arch region but forwardly of a rear end of said heel region of said foot plate means, upright bar means having a lower substantially L-shaped bar portion provided with a lower substantially horizontal leg adapted to be received in said slot and with a substantially upright leg extending upwardly from said lower leg, said upright bar means also having an upper bar portion extending upwardly from said upright leg of said lower bar portion, said upright bar means including a pivot means interconnecting said upper bar portion at a lower end region thereof and said lower bar portion at an upper end region thereof pivotally to each other for providing a given degree of turning of said upper bar portion with respect to said lower bar portion about an axis extending transversely across said foot plate means, said upper bar portion of said upright bar means terminating in an upper end region distant from said lower bar portion, upper strap means connected with said upper end region of said upper bar portion for encircling a leg above the ankle thereof for securing said upright bar means at said upper end region of said upper bar portion thereof to a leg, and ankle strap means operatively connected with said foot plate means to the rear of said slot for securing said foot plate means to a foot at the region of an ankle thereof, said foot plate means, upright bar means, upper strap means, and ankle strap means forming a unit of separate from a shoe and capable of being removably inserted into a shoe, so that said unit can be used with different shoes, said foot plate means being formed to the rear of said slot beneath said upper surface of said foot plate

means with an additional slot extending transversely of said foot plate means for receiving a part of said ankle strap means.

4,102,338

HARDENABLE SHEET MATERIALS

Robert Sydney Richard Parker, Little Hallingbury, Near Bishop's Stortford, England, assignor to National Research Development Corporation, England

Continuation of Ser. No. 525,731, Nov. 21, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,309

Claims priority, application United Kingdom, Nov. 29, 1973, 55471/73

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—90 37 Claims

1. A water-hardenable sheet useful as a splinting material for portions of the human and animal anatomy which comprises a flexible web having adhered thereto a cement-forming material, said cement-forming material comprising a water-soluble poly(carboxylic acid) or a precursor thereof that forms a poly(carboxylic acid) on contact with water and an ion-leachable inorganic particulate material, which together form a cement upon contact with water, said cement-forming material being present in an amount sufficient to form a splinting material for portions of the human or animal anatomy upon the addition of the amount of water necessary to harden said sheet.

4,102,339

DEVICES FOR TENSIONING SURGICAL APPLIANCES

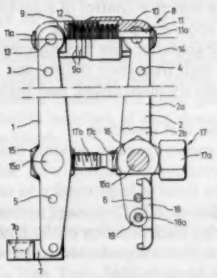
Bernhard Georg Weber, St. Gall, and Beat Flury, Holstein, both of Switzerland, assignors to Synthes AG, Switzerland

Filed Mar. 17, 1977, Ser. No. 778,374

Claims priority, application Switzerland, Mar. 26, 1976, 3801/76

Int. Cl.[2] A61B *17/18;* A61F *5/04*

U.S. Cl. 128—92 E 14 Claims



10. A surgical tensioning device comprising a first and second lever means, an anchor means pivotally connected to one end of one of said lever means, a hook means pivotally connected to a corresponding end of other lever means, means for articulatedly connecting the other ends of the respective levers, and means connected intermediate the ends of said first and second lever for adjusting the spacing between said anchor means and hook means.

4,102,340

DISPOSABLE ARTICLE WITH PARTICULATE HYDROPHILIC POLYMER IN AN ABSORBENT BED

Frederick K. Mesek, Downers Grove, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 531,130, Dec. 9, 1974, abandoned. This application May 9, 1977, Ser. No. 795,149

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 25 Claims

1. An absorbent article of manufacture having a multi-layer absorbent pad means, a moisture-impervious backing sheet on one side of the absorbent pad means, and a porous moisture-impermeable facing sheet overlying the other side of the absorbent pad means; said absorbent pad means comprising a fibrous structure having an intermediate densified fibrous layer, a layer of highly porous, loosely-compacted batt on each side of the densified layer, and a particulate, water-insoluble but water-swellable, polymeric absorbent only in the batt layer situated between the densified layer and the moisture-impervious backing sheet, said particulate absorbent being distributed substantially uniformly throughout said last mentioned batt to define a widely distributed liquid receiving and holding means that is adapted to receive liquid directly from said densified layer, the

batt without said particulate absorbent being at least coextensive in external dimension as the batt containing said particulate absorbent, whereby transfer of liquid from said particulate absorbent to said facing layer is retarded; said densified layer being integral with and formed from a portion of the fibers of at least one of the loosely-compacted batts, said densified layer having relatively higher wickability and relatively higher liquid retentivity than the loosely-compacted batt from which it is formed and defining means for rapidly wicking liquid outwardly from an initially wetted area for enhanced liquid transfer over a large area into the batt containing the particulate absorbent and located between the densified layer and the moisture-impervious backing sheet.

4,102,341

ELECTRIC KNIFE DEVICE

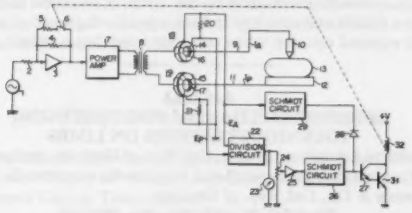
Yuzi Ikuno, Fuchu, and Yutaka Tanaka, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,015

Claims priority, application Japan, Dec. 20, 1975, 50-152368

Int. Cl.[2] A61N *3/02*

U.S. Cl. 128—303.14 8 Claims



1. An electric knife device comprising a high frequency current source having first and second output terminals, a knife electrode connected to the first output terminal, a patient electrode connected to the second output terminal and to be electrically contacted with the patient, first current detector means for detecting the current flowing between the first output terminal and said knife electrode, second current detector means for detecting the current flowing between the second output terminal and said patient electrode, division circuit means for calculating the ratio between the outputs of said first and second current detector means and means fed by the output of said division circuit means for controlling the high frequency current flowing through said knife electrode in

accordance with the ratio calculated by said division circuit means.

4,102,342

VALVED DEVICE

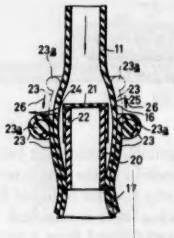
Taichiro Akiyama, Tokyo; Sajiro Ookubo, Oomiya, and Setsuko Ueno, Tokyo, all of Japan, assignors to Taichiro Akiyama, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,076

Claims priority, application Japan, Dec. 29, 1975, 50-156317; May 28, 1976, 50-69345[U]

Int. Cl.[2] A61B 17/12

U.S. Cl. 128—325 **8 Claims**



1. A valved device including a chamber, an outer pipe having an interior portion which normally communicates in fluid-tight manner with the interior of said chamber, an opening being provided in said outer pipe and communicating said interior portion with the exterior of said outer pipe, and a hollow valve member attached in surrounding relationship with said outer pipe in such a manner that said opening is normally closed by said valve member, said valve member being adapted to be rolled up on itself along said outer pipe into a ring-shaped configuration whereby said opening is exposed to permit discharge of said fluid, said valve member being attached to a tapered surface of said outer pipe, the valve member being formed of an elastic material with sufficient elasticity such that the valve member normally resists being rolled up on itself and is elastically restored by its elastic force to its original state to close said opening when rolling force is removed, said chamber comprising an envelope connected to said outer pipe, said envelope being adapted to elastically expand and contract, and wherein said envelope is adapted to be expanded by forcibly supplying a fluid through said pipe, and said envelope contracts by the action of its elastic force so that a fluid in said envelope is discharged through said pipe and said exposed opening when said valve member is rolled up.

4,102,343

LIGATURE MECHANISM FOR PRODUCING TOURNIQUET EFFECTS ON LIMBS

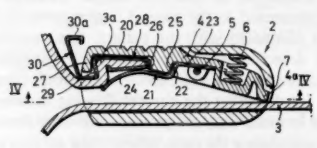
Eberhard Schneider, Cologne, Fed. Rep. of Germany, assignor to Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co., Fed. Rep. of Germany

Filed Jul. 27, 1976, Ser. No. 709,245

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536620; Sep. 17, 1975, 2541433

Int. Cl.[2] A61B 17/12

U.S. Cl. 128—327 **18 Claims**



1. A ligature mechanism for producing tourniquet effects on limbs comprising a casing, a clamping lever, means mounting said clamping lever for pivotal movement relative to said casing, a band, said band including first and second terminal end portions and a loop portion therebetween, aperture means in said casing for permitting the passaage of said first terminal end portion through said casing, a portion of said band between said loop and said first terminal end portion being clamped relative to said casing by said clamping lever, fitting means carried by said second terminal end portion, spring means releasably clampingly securing said second terminal end portion fitting means to said lever, and means for releasing the clamping effect of said spring means to release said second terminal end portion from said clamping lever.

4,102,344

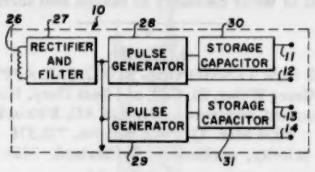
STIMULATOR APPARATUS FOR INTERNAL BODY ORGAN

Christopher J. Conway, Edina, and Eugene G. Glover, St. Paul, both of Minn., assignors to Mentor Corporation, Minneapolis, Minn.

Filed Nov. 15, 1976, Ser. No. 741,948

Int. Cl.[2] A61N 1/32

U.S. Cl. 128—419 E **10 Claims**



1. Apparatus for periodically stimulating an internal body organ under the selective control of a device located outside of the body, said apparatus comprising:

an external transmitter unit having means for producing a relatively high frequency output and means for periodically effectively interrupting said high frequency output: and

an implantable unit including

a power supply portion having output terminals and means reactively coupled with said transmitter unit when the latter is in proximity to said implantable unit for producing a D.C. voltage across said output terminals during each duration of the high frequency output,

at least one electrode adapted to be affixed adjacent the organ to be stimulated,

an energy storage device,

an electronic switching device having control elements which cause said electronic switching device to be non-conductive when a voltage of at least a predetermined value is applied between said elements,

circuit means connecting said energy storage device, said electrode, and said electronic switching device in series,

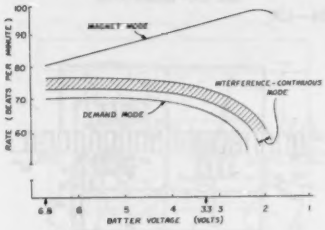
means connecting said power supply portion to said energy storage device to cause energy to be stored in the latter while said switching device is in non-conducting condition,

and means connected across the output terminals of said power supply portion and to said control elements of said switching device for deriving from said power supply portion and applying to said control elements a voltage of at least said predetermined value so that said switching device is non-conductive while said power supply portion is supplying a voltage and means for causing said switching device to become conductive each time said voltage ceases, to cause said energy storage device to cause periodic energization of said electrode to stimulate said organ.

4,102,345
PACER DEMAND-RATE TEST MODE CONTROL

Robert Lee Cannon, III, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 21, 1977, Ser. No. 789,489
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 PT 10 Claims



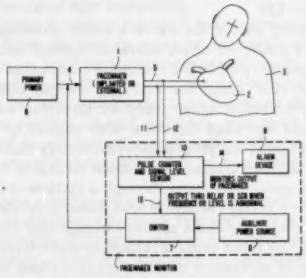
1. In an improved implantable electronic demand heart pacer for providing stimulation to the heart of a patient, said pacer including terminal means for connection to said heart, a power source for energizing circuitry of said pacer, pulse generator means connected to said source for supplying heart-stimulating impulses at predetermined rates on said terminal means, means for detecting the beating action of said patient's heart as well as said stimulation impulses, means responsive to said detecting means for enabling said pulse generator means to supply said impulses at a demand-rate substantially only in the presence of detected stimulation impulses and the absence of detected heartbeats, and test mode means including manual means for making said stimulation rate dependent upon and indicative of the condition of said source, the improvement comprising:

said test mode means further including demand-rate control means operative for temporarily preventing detection of the patient's heartbeats by said detecting means while concurrently allowing said detecting means to detect said stimulation impulses whereby said means responsive to said detecting means enables said pulse generator to supply said stimulation impulses at said demand-rate in the presence of heartbeats.

4,102,346
HEART PACEMAKER MONITOR, ALARM AND AUXILIARY POWER SUPPLY

Mabel H. Fulker, Tempe, Ariz., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sep. 1, 1977, Ser. No. 829,612
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 PS 3 Claims



1. A pacemaker monitor for a pacemaker of a human heart, such pacemaker having an input, a primary battery source of power electrically connected to its input, and an output electrically connected to the heart of a user, said pacemaker monitor comprising

an auxiliary battery source of power;

switch means electrically connecting the auxiliary battery source of power to the input of the pacemaker;

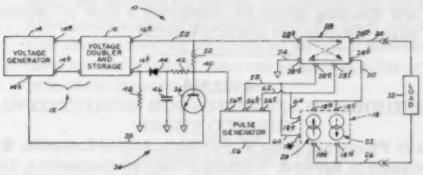
an alarm device; and

a monitor device having inputs electrically connected to the output of the pacemaker and outputs electrically connected to the switch means and to the alarm device for counting the pulses supplied to the heart by the pacemaker, detecting the signal level of such pulses and comparing the number of pulses with a preselected number and the signal level with a preselected signal level and closing the switch means to connect the auxiliary battery source of power to the pacemaker and actuating the alarm device when the detected number is less than the preselected number and when the detected level is less than the preselected level.

4,102,347
ELECTRONIC PAIN CONTROL SYSTEM

Tex N. Yukl, 1905 SW. Cedar Hills Blvd., Portland, Oreg. 97225

Filed Dec. 3, 1976, Ser. No. 747,352
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—421 6 Claims



1. A current supply circuit comprising

a pair of output terminals adapted for connection to a load,

a current source operatively connected to said terminals for supplying current to a load connected therebetween,

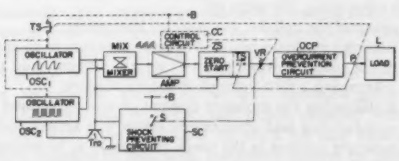
a changeable-level voltage source for and operatively connected both to said current source and to said terminals, and

voltage-level control means operatively connected both to said output terminals and to said voltage source for sensing the impedance value of any load connected between said terminals, and for changing the level of voltage produced by said voltage source in accordance with the value of such sensed impedance.

4,102,348
LOW FREQUENCY MEDICAL TREATMENT APPARATUS

Sokichi Hihara, Yokohama; Mikio Horiuchi, and Takeshi Ohe, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed May 13, 1977, Ser. No. 796,512
Claims priority, application Japan, May 19, 1976, 51-56687
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—422 5 Claims



1. A low frequency medical treatment apparatus for applying through a touching element to the human body a medical

treatment wave obtained by mixing a modulating wave of low frequency and fundamental wave of higher frequency than that of the modulating wave, which apparatus comprising:

(a) oscillating means for synchronously generating a modulating wave which rises relatively moderately and decays relatively abruptly, and after a pause interval rises moderately again, and a pulsive fundamental wave whose frequency is higher than that of said modulating wave;

(b) mixing means connected to said oscillating means, for mixing said modulating wave and fundamental wave generated by said oscillating means to produce a mixed wave;

(c) zero start means for delivering the mixed wave starting at the zero level thereof under conditions that said modulating wave is in a pause interval and said touching element is in contact with the human body;

(d) output control means for controlling a level of said mixed wave according to a setting operating thereof, said output control means having a switch which is turned on or off depending on whether or not said output control means is set at its minimum set position;

(e) shock preventing means for controlling at least one of paths of said modulating wave, fundamental wave and transmission mixed wave so that when said output control means is set at the minimum set position, said switch of said output control means is operated to deliver said mixed wave; and

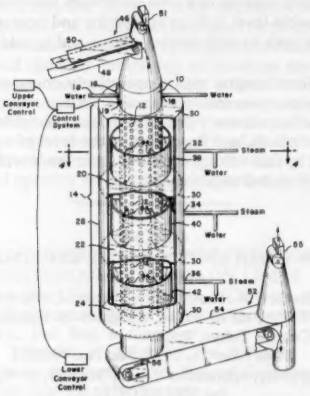
(f) over-current preventing means operatively connected to said touching means for preventing a flow of excessive mixed wave in said touching element.

4,102,349

METHOD AND APPARATUS FOR MOISTURIZING TOBACCO STEMS

John D. Psaras, and Leroy R. Sachleben, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 15, 1976, Ser. No. 705,741
Int. Cl.[2] A24B *3/00, 3/12*
U.S. Cl. 131—135 **43 Claims**



26. A method for uniformly moisturizing whole tobacco stems comprising the steps of:

a. opening the cellular structure of said stems;

b. inducing moisture into said cellular structure in an amount in the range of from 20 to 40 weight percent, said range comprising a first induced moisture content;

c. equlibrating the moisture content of said stems; and

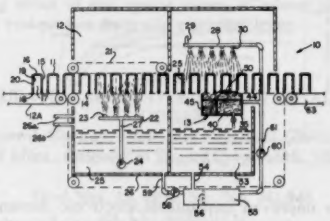
d. moisturizing said equilibrated stems to a second induced moisture content in the range of from 30 to 60 percent by initially spraying said equilibrated stems with water and thereafter applying a mixture of water and steam to said stems.

4,102,350

APPARATUS FOR REMOVING EXCESS COATING MATERIAL ACCUMULATED AT THE INTERIOR EDGE PORTIONS OF METAL CONTAINERS

Raymond G. Chelton, Chicago; Elmer C. Ginther, Oak Forest, and Mihailo Djordjevic, Dolton, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,892
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—130 **4 Claims**



1. An apparatus for removing excess coating material accumulated at the interior edge portion of an open end of a metal container which portion is to be subjected to double seaming after the excess coating material is removed, the apparatus comprising a receptacle adapted to contain a supply of wash fluid capable of diluting the accumulated coating, a movable reticulated web for conveying the coated container in an upright inverted position with the open end contacting the web, means for moving the web over the receptacle, means for continuously trickling the wash fluid upwardly from the receptacle through the web into contact with the interior edge portion of the container at a flow rate which does not materially effect the position of the inverted container, the trickle of wash fluid being in the form of a ripple having waves of a height sufficient to contact the interior edge portion of the container which is to be subjected to double seaming and which swell within the container interior to effect a washing action on the accumulated coating material.

4,102,351

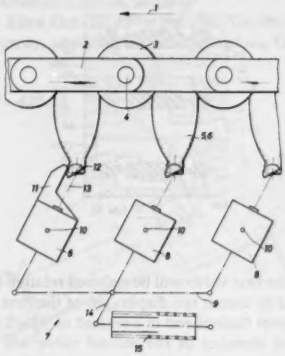
SPRAYING DEVICE FOR USE IN A BOTTLE CLEANING MACHINE

Joachim Wiendahl, Dortmund; Klaus Jendrichowski, Holzwickede, and Wolfgang Süshradt, Dortmund, all of Germany, assignors to Holstein und Kappert Aktiengesellschaft, Dortmund, Germany

Filed Feb. 10, 1977, Ser. No. 767,315
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607077
Int. Cl.[2] B08B *3/02;* B67C *1/00*
U.S. Cl. 134—129 **5 Claims**

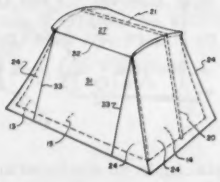
1. A spraying device for use in a bottle cleaning machine, comprising a conveyor chain movable through said cleaning machine, a plurality of bottle receiving receptacles supported on said conveyor chain for carrying therein bottles to be cleaned, a plurality of spray tubes for directing a spray in a predetermined and fixed direction with respect to said spray tubes and mounted for pivotal movement only through a predetermined angle of displacement about an axis of rotation for directing the spray therefrom through a predetermined spraying zone into a bottle carried in said bottle receiving receptacles as said conveyor chain moves through said cleaning machine, said spray tubes being arranged in series with respect to the direction of movement of said conveyor chain so that each spray tube is oriented to direct its spray through said angle of displacement into one of said bottles as said bottles move through said spraying zone, coupling means connecting each of said plurality of spray tubes with each other to cause each spray tube to be pivoted about its axis of rotation together with

each other spray tube of said plurality through the same angle of displacement, a driving pin carried by each of said bottle receiving receptacles, a driver arm carried by at least one of said spray tubes to be engaged by a driving pin of one of said receptacles for causing pivotal movement of each of said spray tubes through said predetermined angle from a starting position to an end position defining said spraying zone without



causing longitudinal displacement of said spray tubes in the direction of said conveyor, said driving pin engaging said driver arm at the starting position of said spraying zone and being disengaged therefrom at said end position as said conveyor chain moves through said cleaning machine, and means connected with said spray tubes for pivotally returning said spray tubes to said starting position when said spray tubes have reached said end position of said spraying zone.

4,102,352
INSULATED TENT
Arthur J. Kirkham, 5534 Avalon Dr., Murray, Utah 84107
Continuation of Ser. No. 670,233, Mar. 25, 1976, abandoned.
This application Nov. 1, 1976, Ser. No. 737,701
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—1 R **33 Claims**



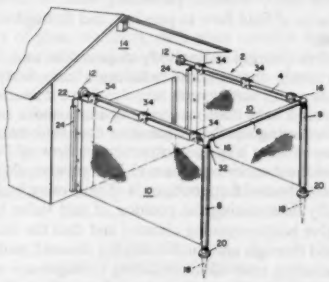
1. An insulated tent comprising

(a) a flexible inner tent structure having interconnecting end and sidewalls, one or more of said sidewalls containing doors, a roof interconnecting said walls and hollow sleeves adapted to receive resilient crossarms, said sleeves being of substantially the same length as the end of the upper portion of said endwalls, and being fixedly connected to and extending outwardly of the inner tent structure along the interconnecting portion of the endwalls and roof;

(b) support structure external of the inner tent having means to hold the base of the inner tent walls in a taut rectangular substantially horizontal position including, an upright pole extending upwardly, adjacent to and midway of each endwall, said upright pole being at least as long as the distance between the top and bottom of the endwall, a horizontal ridgepole of substantially the same length as the length of the inner roof fabric, said ridgepole interconnecting the upright poles at each end by fastening means, resilient crossarms being inserted into said sleeves, said crossarms being longer than said sleeves thereby protruding from each end sleeve opening, means holding said crossarms in a fixed, tensioned, curvilinear position by means contacting the central portion of said resilient crossarms, the outer portion of the ridgepole or the fastening means interconnecting said poles, said support structure functioning such that the upright poles hold the tent in a taut vertical position, the ridgepole holds the tent in a taut horizontal direction along the ridgepole and the resilient crossarms pull the tent walls and roof outwardly and upwardly in a taut position;

(c) at least one but not more than two outer end sections fitted to the upper portion of either end of the supporting tent structure having a configuration substantially the same as, but larger than, the end portion of the inner tent structure taken along a vertical transverse plane of the inner tent structure approximately at the points the resilient crossarms protrude from the open ends of the sleeves, said outer end sections containing reinforced apertures in the upper corners thereof adapted to fit over the ends of the resilient crossarms and rest against the outside edges of said sleeves in a taut position, fastening means located at the top midportion of said outer end section for fixedly securing said portion to the support structure in the vicinity of the juncture of the upright poles and ridgepole and means for securing the bottom of said outer end section in a taut position spaced outwardly from the inner tent structure thereby creating an insulated air space between the inner tent walls and the outer end sections at either or both ends of the inner tent structure.

4,102,353
TEMPORARY SHELTER
Charles Pugliese, 83 Peguot La., E. Islip, N.Y. 11730
Filed Jan. 27, 1977, Ser. No. 762,998
Int. Cl.[2] A45F *1/06*
U.S. Cl. 135—5 R **3 Claims**



1. A portable enclosure adapted for attachment to a permanent structure which rests on the ground, said enclosure comprising means for mounting on said structure and for providing spaced, parallel and vertical slots, means for installation in the ground at positions spaced from and corresponding to said slots and for providing upwardly open receptacles, means for installation on said structure above said slots and for providing horizontally open receptacles, side bars extending horizontally outwards from said horizontally open receptacles, a cross-bar extending between said side bars above said upwardly open receptacles, poles extending upwardly out of said upwardly open receptacles, three-way sockets interconnecting said poles, side bars and cross-bar, side panels engaged with said side bars and poles, T-shaped supports on said panels and slidably engaged in said slots, releasable catches on said side bars holding the latter within the horizontally open receptacles, said side bars and cross-bar constituting a horizontal

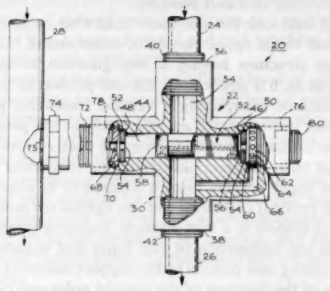
frame, a roof, and spring clips releasably attaching said roof to said horizontal frame.

4,102,354

SELF-REGULATING FLUID PRESSURE AND TEMPERATURE VALVE AND ASSEMBLY

Michele Natale, 9812 Amanita Ave., Tujunga, Calif. 91042

Filed Sep. 27, 1976, Ser. No. 726,608
Int. Cl.[2] G05D *11/03*
U.S. Cl. 137—98 **24 Claims**



1. An improved self-regulating fluid pressure and temperature valve, said valve comprising, in combination:

a. a valve housing having (1) a single fluid-receiving channel extending therethrough for direct connection with a first source of fluid flow, (2) a valve body-receiving channel intersecting said fluid-receiving channel in said housing and extending on opposite sides of said fluid-receiving channel, (3) a fluid-pressure passageway leading from said fluid-receiving channel into communication with one end of said valve body-receiving channel for transmittal of fluid pressure thereto, and (4) conduit means for interconnecting the opposite end of said valve body receiving channel with pressure from a remote second source of fluid flow, without permitting fluid from said second source of fluid flow to pass into and through said housing; and,

b. a free-floating valve body disposed in said valve body-receiving channel and including a main body portion of dimensions sufficient to largely obstruct the flow of fluids through said fluid-receiving channel and a reduced portion having smaller dimensions than said main body portion so as to largely unobstruct the flow of fluid through said fluid-receiving channel, the relative fluid pressures exerted on said opposite ends of said valve body automatically determining the position of said valve body in said valve body-receiving channel and thus the rate of flow of fluid through said fluid-receiving channel, said valve body including inter-communicating passageways extending to the exterior thereof at spaced locations to facilitate a reduction in weight and free flotation of said valve body.

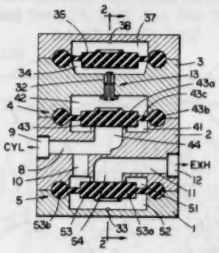
4,102,355

DIAPHRAGM MULTI-PORT VALVE ASSEMBLY

Albert Frederick Hansen, Punga Grove Rd., Whangarei, New Zealand

Filed Nov. 29, 1976, Ser. No. 745,527
Int. Cl.[2] F15B *13/042*
U.S. Cl. 137—596.15 **9 Claims**

1. A diaphragm valve assembly comprising a first and a second diaphragm valve each comprising a first and a second chamber separated by a diaphragm, a valve port for communication with the first chamber and normally closed by the diaphragm, bleed means connecting the first and second chambers, and control means for actuating the valve, wherein the first chamber of the first valve has an inlet for communication with a supply of fluid under pressure, the port of the first valve is adapted for connection to apparatus to be controlled by fluid under pressure and is connected to the first chamber of the second valve, the port of the second valve is adapted for connection to exhaust, and the second chambers of the valves are connected to the control means which is placeable in at least two conditions in a first of which the pressure in the second



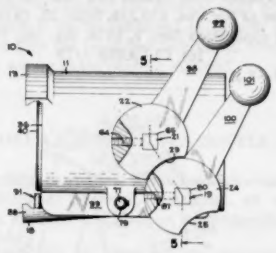
chamber of the first valve will be reduced relative to that in the first chamber to permit the diaphragm of the first valve to lift to open the port thereof and in a second of which the pressure in the second chamber of the second valve will be reduced relative to that in the first chamber to permit the diaphragm of the second valve to lift to open the port thereof.

4,102,356

DRY-BREAK COUPLER

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

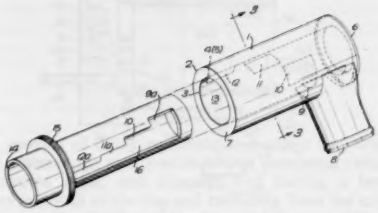
Filed May 31, 1977, Ser. No. 801,719
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 137—614.06 **12 Claims**



1. A dry-break coupler for attachment to an adapter that has an annular locking rib surrounding a central valve, said coupler comprising a tubular body that defines a central flow passage, an adapter latch that is pivotally mounted on the tubular body for locking the adapter in sealed contact with the coupler so that the central valve of the adapter is aligned in series with the central flow passage of the coupler, a first rotatable shaft that is mounted upon the tubular body for operating the adapter latch, a movable valve closure element that is located within the tubular body for both opening and closing the flow passage and for actuating the valved adapter, a second rotatable shaft that extends through the tubular body for operating the movable valve closure element, said first and second rotatable shafts having portions that extend in substantially parallel relationship, and interlocking means mounted upon said rotatable shafts to prevent rotation of the second rotatable shaft as to open the flow passage to the adapter without first moving the adapter latch to a locked position, said interlocking means preventing rotation of the first rotatable shaft to release the coupler adapter latch from the adapter

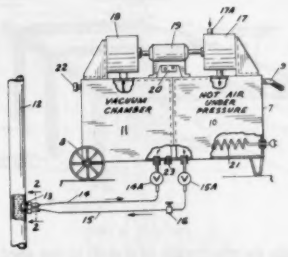
when the valve closure element is in a position with the flow passage open.

4,102,357
VARIABLE FLOW OUTLET VALVES
Mark Charlton, Market Weighton, England, assignor to Hawker Siddeley Aviation Limited, England
Filed Oct. 22, 1976, Ser. No. 734,993
Claims priority, application United Kingdom, Oct. 24, 1975, 43859/75
Int. Cl.[2] F16K 5/10
U.S. Cl. 137—625.32 4 Claims



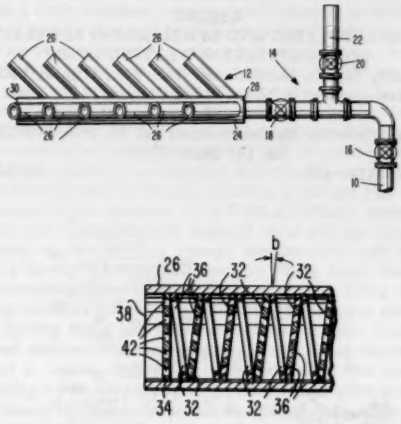
1. A viasuable outlet are distorbution valve, comprising an outer valve body and a coaxial inner valve sleeve rotatable therein, the outer valve body having inner and outer generally cylindrical wall members with a space between filled with porous material and an air inlet communicating with said space at one end, and the inner sleeve fitting within the inner cylindrical member of the outer body and having an air outlet from the sleeve interior at one end of said sleeve, cooperating ports being provided in the sleeve wall and in the inner cylindrical member of the outer body such that relative rotation of the inner sleeve and outer body changes the axial position along the body and sleeve at which the porous-material filled space in the outer body communicates with the interior of the sleeve.

4,102,358
PIPE THAWING DEVICE
Duane Sherock, P.O. Box 131, Plymouth, Mich. 48170
Filed Aug. 8, 1977, Ser. No. 822,673
Int. Cl.[2] E03B 7/14; F16L 53/00
U.S. Cl. 138—35 6 Claims



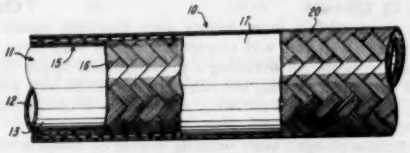
1. In a device of the character described, in combination, a receptacle having a pressure compartment and a vacuum compartment, means to put pressure on said pressure compartment and pull a vacuum on said vacuum compartment, a fitting secured to a frozen pipe, lines communicating the interior of said pipe with the interior of said pressure and said vacuum compartments, means to heat the air in said pressure compartment and control means in said lines to regulate the flow of hot air from said pressure compartment through said fitting and back into said vacuum compartment.

4,102,359
NOISE SUPPRESSOR
Cowas G. Patel, 2179-1 Castor Ct., Tallahassee, Fla. 32303
Filed Feb. 15, 1977, Ser. No. 768,801
Int. Cl.[2] F15D 1/02
U.S. Cl. 138—42 23 Claims



1. A noise suppressor comprising:
a first elongated cylindrical pipe member having a first end adapted for attachment to a pressurized gas outlet, having a closed second end, and having a plurality of openings through the sidewall thereof;
a plurality of cylindrical second pipe members, each having a first end attached to the sidewall of said first pipe member over one of the sidewall openings, to permit fluid communication from the interior of said first pipe member to the interiors of said second pipe members, and an open second end; and
a plurality of plate members, each plate member being substantially circular and having a plurality of substantially parallel elongated slots therethrough, each of said second pipe members having a plurality of said plate members mounted therein, the plate members within each second pipe member slanted with respect to a plane normal to the second pipe member longitudinal axis, the direction of slanting alternating between adjacent plate members, each plate member touching its adjacent plate members.

4,102,360
HOSE CONSTRUCTION
Carl E. Hopkins, Dover, N.J., assignor to Dayco Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 426,986, Dec. 20, 1973, abandoned. This application Jun. 6, 1975, Ser. No. 584,448
Int. Cl.[2] F16L 11/08
U.S. Cl. 138—127 6 Claims



1. A hose construction comprising, an inner tube of irradiated-cured polyethylene, a layer of primer adjoining said tube with said primer layer having an affinity for cured polyethyl-

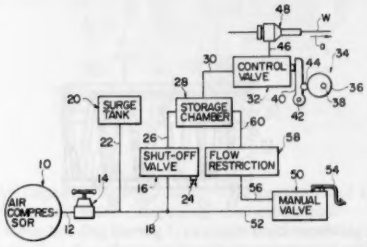
ene, a layer of adhesive on said layer of primer, at least one layer of tubular reinforcing material disposed against said layer of adhesive, said layers of primer and adhesive assuring a proper bond between said cured polyethylene tube and said braided layer, and a layer of vulcanized rubber adjoining said layer of tubular reinforcing material, said tube and said layers bonded together into a unitary structure.

4,102,361

FLUID SUPPLYING AND DISCHARGING APPARATUS FOR SHUTTLELESS WEAVING LOOM

Shigenori Tanaka, Hachioji, and Akio Tojo, Higashi, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,112
Claims priority, application Japan, Jul. 23, 1976, 51-87221
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **38 Claims**



1. A fluid supplying and discharging apparatus for use in a weaving loom of the shuttleless type, comprising a source of fluid under pressure, fluid discharge means communicable with the fluid source and operative to eject a jet stream of the fluid into a weaving shed formed by warp yarns in the loom, first valve means provided between said fluid source and said fluid discharge means and operative to intermittently open in synchronism with the weaving cycles of the loom, second valve means provided between said first valve means and said fluid source and operative to establish communication between the fluid source and the first valve means in response to operative condition of the loom, the second valve means interrupting the communication between the fluid source and the first valve means in response to inoperative condition of the loom, third valve means bypassing said second valve means from said fluid source, the third valve means being manually operable for providing communication between the fluid source and the fluid discharge means when manually operated to open, and flow restriction means for reducing to a predetermined level the pressure of the fluid to be passed to said fluid discharge means through said third valve means.

4,102,362

SHUTTLELESS LOOM

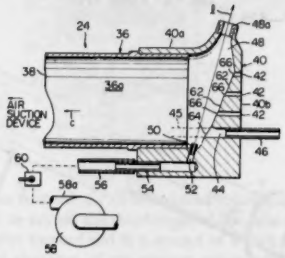
Akio Tojo, Higashi-murayama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,222
Claims priority, application Japan, Aug. 10, 1976, 51-94489
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—435 **7 Claims**

1. A shuttleless loom having yarn throwing means for throwing a weft yarn with respect to a shed of warp yarns, and detaining means for detaining a predetermined length of the weft yarn in air flowing therethrough before the weft yarn is supplied to the yarn throwing means, said detaining means comprising;

a hollow elongate body defining therein an elongate chamber through which air is inductable, said hollow elongate body having a first end portion communicating in use with means for inducting air, and a second end portion opposite to said first end portion, said second end portion having an inlet bore providing communication between the elongate chamber and the outside of said hollow elongate body for introducing the weft yarn into the elongate chamber, and an outlet opening providing communication between the elongate chamber and the outside of said hollow elongate body for drawing out the weft yarn from the elongate chamber;

the second end portion of said hollow elongate body including a sleeve and a closing end wall closing an end formed by the sleeve, said closing end wall having a plurality of elongate bores providing communication between the



elongate chamber and the outside of said hollow elongate body and arranged parallel to the longitudinal axis of said hollow elongate body to induct air therethrough into the elongate chamber, the inlet bore extending through said closing end wall;

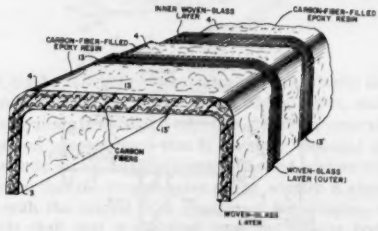
air ejecting means for ejecting air from a portion of said second end portion adjacent said inlet opening through the elongate chamber towards the inlet opening, and said air ejecting means including an air ejecting nozzle member in the sleeve of the second end portion of said hollow elongate body and projecting into the elongate chamber.

4,102,363

NEEDLES FOR SHUTTLE-LESS LOOMS

Albert Henri Deborde, Bourgoin-Jallieu, France, assignor to Saurer Diederichs (Societe Anonyme), Bourgoin-Jallieu, France

Filed Nov. 19, 1976, Ser. No. 743,521
Claims priority, application France, Feb. 10, 1976, 76 04369
Int. Cl.[2] D03D *47/18*
U.S. Cl. 139—449 **2 Claims**



1. A needle for the laying of a weft in the shed of a shutterless loom comprising an elongated U-cross section body of carbon fibers impregnated with a synthetic resin, said body having a web and a pair of shanks extending transversely to said web, said web having a thickness greater than that of said shanks, and a pair of woven glass fiber layers imbedded in said synthetic resin and extending over said shanks and said web, one of said glass fiber layers lying as close as possible to the outer surface of said body, the other of said glass fiber layers lying as close as possible to the inner surface of said body, each of said glass fiber layers being spaced inwardly of the respective surface by substantially constant distances.

4,102,364
METHOD OF DUNNAGE BAG INFLATION

John H. Leslie, Winnetka; Barry R. Angarola, Schaumburg, and A. L. Nocom, Des Plaines, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jul. 29, 1977, Ser. No. 820,088
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—4 16 Claims

1. A method of filling an inflatable dunnage bag with entrained ambient air to a predetermined maximum stabilized pressurization level, said dunnage bag having a housing mounted in a wall of the bag and extending from the exterior of the bag to the interior of the bag, said housing defining a smooth-walled chamber having an exterior opening in a portion of the exterior of the bag and an interior opening in a portion of the housing communicating with the interior of the bag, said method comprising the steps of:

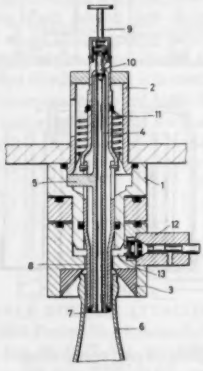
discharging at least one jet of pressurized gas from a discharge point located in a region of ambient air; and

aligning each said gas jet to pass through at least part of said chamber in the direction from said exterior opening to said interior opening whereby ambient air is entrained with the jet through the chamber into the bag.

4,102,365
FILLING MEMBER FOR A COUNTERPRESSURE FILLING MACHINE

Heinrich Jordan, Dortmund, and Siegmar Sindermann, Kamen-Heeren, both of Germany, assignors to Holstein & Kappert Aktiengesellschaft, Dortmund, Germany

Filed Nov. 24, 1976, Ser. No. 744,463
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2552956
Int. Cl.[2] B67C 3/06
U.S. Cl. 141—39 5 Claims

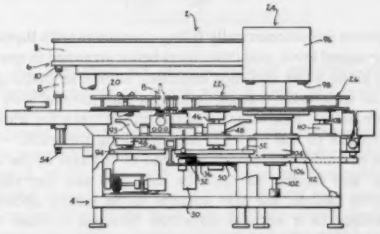


1. A filling member without a feed pipe for a counterpressure filling machine for filling a liquid into containers, such as bottles, cans and the like, including a valve housing having an upper end and a lower end and forming a vertically extending passage opening from the lower end thereof, a top closure for the upper end of said valve housing, a gas pipe extending vertically and concentrically through the passage in said valve housing, said gas pipe having an outlet opening at the lower end thereof supplying a pressurized gas into a container and a gas valve located within said gas pipe above the outlet opening therefrom for controlling flow of the pressurized gas to the container, means for opening said gas valve to initiate the flow of gas into the container, a centering bell mounted on the lower end of said housing and laterally enclosing the lower end of said gas pipe, wherein the improvement comprises that said gas pipe is fixed to said valve housing, a repelling shield formed on the lower end of said gas pipe laterally surrounding the outlet opening therefrom, said repelling shield forming a sealing seat, the lower end of said valve housing forming a guide surface, said centering bell disposed in contact with the guide surface of said valve housing and extending downwardly therefrom for movement thereon in the axial direction of said gas pipe when contacted by the container to be filled, a vertically extending filling sleeve concentrically disposed about said gas pipe and forming an annular flow passage therebetween, said filling sleeve having a lower outlet end for filling liquid into the container positioned by said centering bell, said filling sleeve being vertically displaceable between an upper open position for flowing liquid into the container and a lower normally closed position with the outlet end of said filling sleeve disposed in sealing engagement with the sealing seat on said repelling shield, spring means supported by said valve housing for biasing said filling sleeve into the open position when pressure equalization occurs between the container and said pressurized gas, said gas valve located in the upper part of said gas pipe, said centering bell laterally enclosing said filling sleeve, said centering bell in combination with the lower end of said valve housing and the outer surface of said filling sleeve forming a gas space and a relief valve connected to said centering bell with said relief valve opening to said gas space and having an open position and a closed position and in the open position connecting the gas space to the ambient atmosphere about the filling member means for opening said relief valve upon completion of container filling.

4,102,366
DRIVE MECHANISM FOR CONTAINER FILLING MACHINE

Stanley J. Puskarz, New Berlin, Wis., assignor to A-T-O Inc., Willoughby, Ohio

Filed Dec. 29, 1976, Ser. No. 755,177
Int. Cl.[2] B65B 43/50, 43/52
U.S. Cl. 141—150 9 Claims



1. In a container filling machine having a stationary base and a filler head mounted in the base for rotary movement about a vertical axis, the base being equipped with first and second, rotatably mounted starwheel units for delivering containers into the filler head for filling action and for receiving containers from the head when filling is completed, and the filler head being provided with an upper liquid reservoir containing a series of depending filling valve assemblies for controlling liquid flow into the containers and with a lower turntable

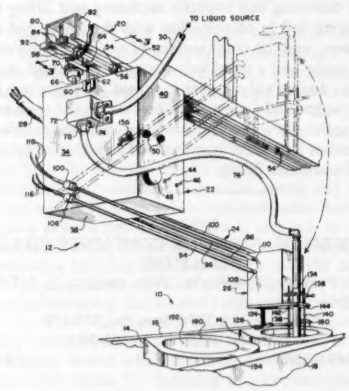
having a series of container support and lift assemblies mounted around its periphery in equi-circumferentially spaced relation to one another for receiving incoming containers and for moving the same into and out of filling positions relatively of said filling valve assemblies during the course of a container filling cycle, a drive means for the filler head and starwheel units, comprising a main power source mounted in the base of the filler, first and second driven gears associated with a first of the starwheel units and secured for rotation therewith as a unit, a drive gear connected to said power source in direct driving relation with said first starwheel unit through a first of said driven gears, a roller means associated with each of said container support and lift assemblies and supported thereby in a fixed horizontal plane, said second driven gear of said first starwheel unit supported in said fixed horizontal plane and engageable with said roller means to drivingly connect said power source to said filler head, and a third driven gear carried by said second starwheel unit in the horizontal plane of said roller means and engageable by said roller means whereby to drivingly connect said second starwheel unit to said power source.

4,102,367

AUTOMATIC FILLING DEVICE

Abe Shulman, and Jere J. Willing, both of Chicago, Ill., assignors to A-Jer Engineering, Inc., Niles, Ill.

Filed Mar. 21, 1977, Ser. No. 779,358
Int. Cl.[2] B65B *1/04, 1/48*
U.S. Cl. 141—231 **25 Claims**



1. A system for automatically filling containers with liquid to a predetermined level, said containers being arranged in spaced locations along a line and each container having an opening to a cavity on its interior, a track defining a path parallel with the line of containers, a carriage mounted on the track for translative movement to and between stations along the track,

an arm pivotally mounted at one end of the arm to the carriage and having its opposite end free and carrying a pouring nozzle, the arm adapted to be swung about its mounting in a vertical direction between at least two positions, the first of which is the normal position above the containers and spaced therefrom to permit movement of the carriage along the track without interference with the containers and the second of which is substantially below said first position and in which the nozzle is correctly disposed for filling the container and vertically aligned witn the container opening in position to fill the same if the container is properly positioned,

a source of liquid, a flexible conduit connected between the source and the pouring nozzle and having a normally closed valve between the source and the nozzle,

first reversible drive means for driving the carriage along the track,

second reversible drive means for raising and lowering the arm between said first and second positions,

electrical circuitry for operating the system, comprising means for energizing the first drive means to move the carriage along said track in a first direction to a first station, means defining the station and deenergizing the first drive means and acting to energize the second drive means to lower the arm to bring the nozzle to correct disposition at said second position,

control means acting to stop the second drive means lowering the arm if and when the arm reaches said second position and opening said valve to fill the container while preventing energizing of said second drive means while said container is being filled but thereafter closing said valve and energizing the second drive means in reverse to raise the arm to said first position,

said control means acting to stop the second drive means lowering the arm in the event that the arm does not or is not capable of reaching said second position without opening said valve, reversing said second driving means and causing the arm to be returned to said first position and deenergizing the second drive means,

said means for energizing said first drive means being once more enabled when the arm has been returned to said first position and acting to move said carriage to the next-to-be reached station with the arm retained in said first position,

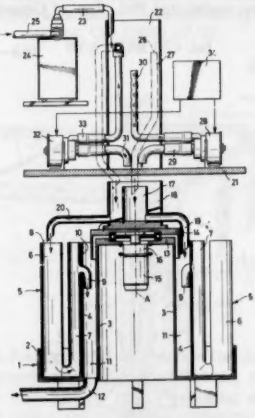
said next-to-be reached station and all other following stations each having elements cooperating with said carriage to provide means for stopping the carriage at each station in turn and attempting to fill the containers.

4,102,368

DEVICE FOR SAMPLING FLUID

Hans Rudolf Marfurt; August Zürrer, both of Marly, and Felix Gärtner, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 9, 1977, Ser. No. 775,926
Claims priority, application Switzerland, Mar. 16, 1976, 3265/76
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—250 **12 Claims**



1. A fluid sampling device comprising:

a vessel support;

a plurality of sample vessels supported on said vessel support, each said sample vessel including first and second substantially upright tubular arms, said first and second arms being joined at bottom ends thereof, said first arm having an upper end with an inlet opening therein, said

second arm having an outlet opening therein, and said outlet opening being at a level below said inlet opening; and

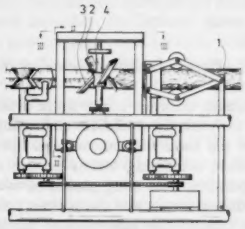
means for sequentially feeding a fluid to be sampled to each of said sample vessels, said feeding means comprising a single buffer vessel adapted to receive therein fluid to be sampled, said buffer vessel having a volume at least three to five times as large as the volume of each said sample vessel, and means for sequentially supplying fluid from said buffer vessel to said first arms of said sample vessels.

4,102,369

MACHINE FOR HEWING SMALL SQUARE TIMBER

Kauko Rautio, Männy haya, Mantyharju, Finland

Filed Jan. 27, 1977, Ser. No. 762,946
Claims priority, application Finland, Feb. 23, 1976, 760460
Int. Cl.[2] B27C *1/08*
U.S. Cl. 144—114 R **1 Claim**



1. An apparatus for hewing substantially small timbers of square cross sectional shape from round tree trunks comprising: supporting means; two vertical and parallel cutting shafts held rotatably by said supporting means; cutting blades mounted on each shaft and arranged so that said cutting blades alternate in inclined direction with respect to the longitudinal axis of the shaft, a first one of said blades being directed upward and forming an angle of 45° with respect to the longitudinal axis of the shaft, second and third adjacent neighboring blades being directed downward and forming an angle of 45° with respect to the longitudinal axis of the shaft, a timber to be hewed being fed horizontally between said vertical cutting shafts, each cutting shaft having said direction alternating blades distributed about the periphery of the shaft at equal intervals, said cutting blades being driven synchronously so than when an upward directed blade is in contact with one side of a timber then a downward directed blade on the other shaft is in contact with the opposite side of the timber, said cutting blades having parallel cutting edges in contact with substantially parallel opposite surfaces of the timber.

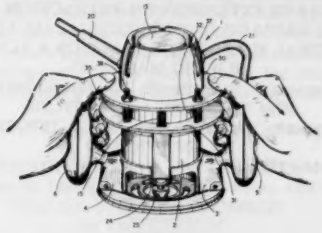
4,102,370

PORTABLE ROUTER ATTACHMENT

P. Jackson Vess, 2901 Poplar Dr., Lynwood, Calif. 90262

Filed Jul. 29, 1977, Ser. No. 820,397
Int. Cl.[2] B27C *5/10*
U.S. Cl. 144—134 D **6 Claims**

1. Apparatus for providing continuous depth-of-cut adjustment for a portable router having a base portion and a motor portion which slidably mounts vertically within said base portion, the apparatus comprising first rigid spacing means for supporting said motor portion adapted to abut the motor portion, second rigid spacing means adapted to abut the base



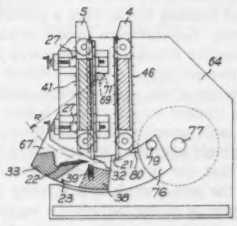
portion, and biasing means for maintaining the first and second spacing means in biased spaced relationship.

4,102,371

APPARATUS FOR CUTTING VARIOUS MATERIALS

Jean Guillerm, Saint Maur, and Jacques Fondronnier, Creteil, both of France, assignors to Centre Technique du Bois, Paris, France

Division of Ser. No. 617,835, Sep. 29, 1975, Pat. No. 4,013,108.
This application Nov. 15, 1976, Ser. No. 741,612
Claims priority, application France, Oct. 8, 1974, 74 33860
The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.
Int. Cl.[2] B27L *5/00*
U.S. Cl. 144—162 R **9 Claims**

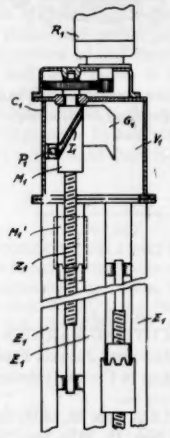


1. An apparatus for cutting various materials and more particularly pieces of wood with a view to obtaining thin products of various thicknesses, comprising two pieces of equipment, on the one hand a cutting tool comprising a knife and a pressure bar, and on the other a support for receiving the material to be cut, said latter piece of equipment being mounted so as to pivot about a geometrical axis spaced from the cutting edge of the knife by a distance corresponding with the constant cutting radius selected and connected to a drive unit which gives to it a pivotal movement in accordance with an amplitude at least equal to the angular opening of the material to be cut, the equipment supporting the material being also provided with a feed device operable to move the material towards the knife as a function of the thickness of the products to be cut, wherein the material supporting equipment is mounted from the cutting tool towards the geometrical pivoting axis, the feed device of the supporting equipment being directed radially and the device having means for regulating the distance between the geometrical axis and the cutting edge.

4,102,372
DEVICE TO FIX THE WOOD-STOCK WITH HOOKS OF DIFFERENT LENGTH AND FOR REMOTE CONTROLLED EXTENSION OR RETRACTION OF SAID HOOKS FROM OR IN THE VERTICAL OR ALMOST VERTICAL SUPPORTING TABLE OF A VENEER SLICING MACHINE

Angelo Cremona, V. le Lombardia, 275, Monza, Italy (20052)

Filed Nov. 1, 1976, Ser. No. 737,276
Claims priority, application Italy, May 21, 1976, 23519 A/76
Int. Cl.[2] B27C 1/00
U.S. Cl. 144—178 6 Claims



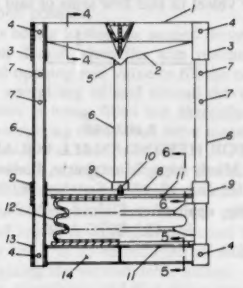
1. A generally vertical veneer slicing apparatus comprising a generally vertical supporting table, a plurality of pairs of opposed holding hooks supported on said table, each of said pairs of hooks forming complementary opposed jaw members, means for effecting vertical adjustment of the respective complementary pairs of holding hooks over a predetermined distance for supporting therebetween wood stock of varying sizes, rotation means for rotating the respective jaw members between an operative projected position relative to said table and an inoperative out of the way position, each of said jaw members having a distinct length at which they project outwardly from said table whereby the respective jaw members are rendered selectively operative to supporting a wood stock therebetween so that the progressively shorter length jaw members support the wood stock as it is being progressively cut away, said adjusting means including a screw operatively connected to each of said complementary pair of jaw members, and a drive means operatively connected to said screw to effect the drive thereof, said rotating means including a nut connected to the respective jaw member, said nut being rotatable on said screw, a helical groove formed in said nut, a pin adapted to be received in said groove whereby said pin effects the rotation of said nut and connected jaw member between operative and inoperative position.

4,102,373
SEMI-AUTOMATIC LOGSPLITTER

Michael Edward Winiasz, 4009 Washington Ave., Lorain, Ohio 44052

Filed May 12, 1977, Ser. No. 796,407
Int. Cl.[2] A47J 49/02; B27L 7/00
U.S. Cl. 144—193 A 10 Claims

1. A semi-automatic log-splitting device comprising:
a base section;
tubular support members having opposite ends, the tubular support members being attachable to the base section;
means on the base section defining means to attach the support members of one of their respective ends to the base section in an upwardly depending relationship;
a detachable sectional splitting means disposed on the other ends of the tubular support members, the splitting means having
a stabilizing point projecting toward the base section,
tapered knife blade means depending outwardly from the stabilizing point toward the tubular support members, and

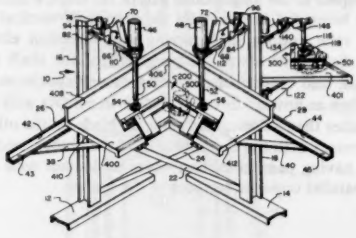


means to adjust the splitting means on the tubular support members;
deflector means attached to the knife blade means;
an axially movable intermediate stabilizing means disposed between the base section and the splitting means, the intermediate stabilizing means having a stabilizing clete for cooperation with a log placed between the intermediate stabilizing means and the splitting means and;
means for forcing the intermediate stabilizing means upwardly, whereby the log is split into sections.

4,102,374
JIG AND TEMPLATE APPARATUS AND METHOD FOR PREPARING A CORNER INSERT FOR A LAMINATED PLASTIC COUNTERTOP

Fred Godfrey Klein, 2861 Cherry Blossom La., Salt Lake City, Utah 84117

Filed Mar. 8, 1976, Ser. No. 664,713
Int. Cl.[2] B23Q 3/06; B27C 5/06
U.S. Cl. 144—314 B 23 Claims

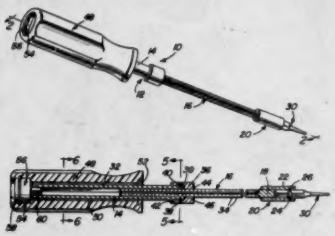


1. Apparatus for preparing an insert to the inside corner of a workpiece fabricated from two elements joined at a miter, comprising:
a female template for guiding a cutting tool in cutting a female segment from the inside corner of the workpiece;
a male template for guiding a cutting tool in cutting a male insert dimensionally corresponding to at least a portion of the periphery of the void created by removal of the female segment; and
a jig comprising a framework including a scaffold and means for holding the workpiece, female template, and male template securely on the scaffold.

4,102,375
VARIABLE-LENGTH TOOL HOLDER

James L. Rossini, 1025 Cedar Pl., Oakdale, Calif. 95361

Filed Jan. 31, 1977, Ser. No. 764,461
Int. Cl.² B25G 1/00
U.S. Cl. 145—75 7 Claims

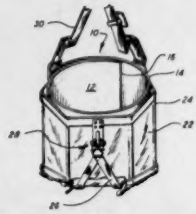


1. A variable-length tool holder, comprising, in combination:
(a) a shank assembly including a hollow shank, and a shaft adjustably inserted into the hollow shank; and
(b) bit holder means mounted on the shaft for retaining a tool bit on the shank assembly, the hollow shank forming a hole having a non-circular cross section, with the shaft also having a non-circular cross section and mating with the cross section of the hole for rotating with the shank while being slidably disposed within the shank, the shaft being a longitudinally extending element provided with external screw threads along a portion of the longitudinal extent thereof, the shank assembly further including a nut rotatably attached to the shank and having an opening receiving the shaft, and internal screw threads provided in the opening of the nut for engaging with the external screw threads of the shaft, rotation of the nut moving the shaft longitudinally relative to the shank for varying the length of the shank assembly.

4,102,376
FRUIT PICKING RECEPTACLE

David E. Sharp, Ji-Meva Farms, P.O. Box 259, North Rose, N.Y. 14516

Filed Jul. 15, 1977, Ser. No. 815,944
Int. Cl.² A01D 46/22
U.S. Cl. 150—2 4 Claims

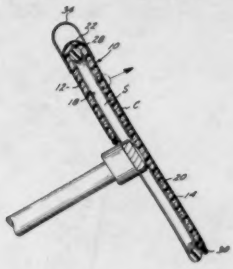


1. A receptacle for use in hand-picking fresh fruit, or the like, of a type susceptable to damage by bruising, said receptacle comprising, in combination;
a. a substantially cylindrical container having side and bottom walls and an open top; and
b. a removable liner formed from a single, flat sheet of flexible, resilient, non-absorbent plastic material and deformable to a configuration substantially conforming to that of the interior of said container, said liner being placed within but unattached to said container and having a thickness and resilience such that fruit deposited in said container is protected by said liner from bruising by contact with said container or objects externally thereof with which said container comes into contact;
c. said liner when laid flat being rectangular with a semi-circular portion extending from one of the long edges thereof, whereby the short edges may be overlapped to form a cylindrical side wall and the semi-circular portion bent substantially at its junction with the rectangular portion to form a bottom wall for insertion in said bag.

4,102,377
STEERING WHEEL COVER DEVICE

Nels M. Ostrem, 128 Mirabeau Ave., San Pedro, Calif. 90732

Filed Oct. 7, 1977, Ser. No. 840,125
Int. Cl.² B62D 1/06
U.S. Cl. 150—52 M 3 Claims

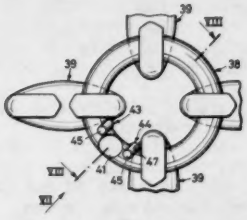


1. A steering wheel cover device, comprising:
a cover sheet of scorch-resistant material formed with an arcuate upper pocket section which receives the upper half of the steering wheel, and a frontal skirt depending from the front of said pocket section to overlie the lower section of the steering wheel; and
a layer of synthetic plastic heat insulating foam secured to the inner surface of said cover sheet that engages the steering wheel.

4,102,378
TIRE CHAIN

Erhard Alfred Weidler, Jahnstrasse 37, 7080 Aalen 1, Fed. Rep. of Germany

Filed Jul. 22, 1976, Ser. No. 707,820
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533832
Int. Cl.² B60C 27/06
U.S. Cl. 152—243 1 Claim



1. Tire chain having a chain network which comprises, at least in part, annular links oriented parallel to the surface of the tire and C-shaped links which are oriented vertically to the surface of the tire and can be hooked in said annular links, characterized by the fact that at least one of the ends of the arms of the C-shaped link which limit the introduction slot of the latter has a cross section which is reduced at the expense of

the width of the end; that the annular link has at least one narrowing the shape of which corresponds to the shape of the end of reduced cross section; and that retaining elements for the C-shaped link which has been attached to the annular link are present in the region of the narrowing; wherein the narrowing of said annular link is formed of two notches with limiting surfaces arranged in X-shape, one of said notches extending parallel to the central plane of said annular link, and said retention elements are formed of inserts which are inserted into said narrowing.

4,102,379

STRUCTURE OF SEALING SPLIT RIM TYPE WHEELS

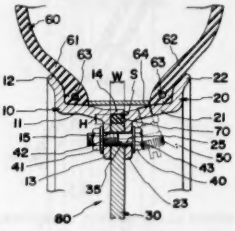
Tadashi Kamiya, Nieza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,954

Claims priority, application Japan, Oct. 3, 1975, 50-134704[U]

Int. Cl.[2] B60B *25/00*

U.S. Cl. 152—405 **4 Claims**



1. A structure for sealing split rim type wheels, comprising:

at least one wheel disc;

a first split rim member provided with an integral jointing piece, said jointing piece having a face thereof butted against a first side face of said wheel disc adjacent the outer periphery of said disc, and being integrally secured to said disc;

said first split rim member being provided with a projecting piece extending substantially perpendicular to the plane of rotation of said disc;

an annular groove, opened substantially on one side only, being formed on the outer periphery of said disc between the outer peripheral edge of said disc, the butted face of said jointing piece, and said projecting piece;

an elastically deformable sealing member substantially securely disposed within said groove;

a second split rim member provided with an integral jointing piece, said jointing piece of said second split rim being adapted to have a face thereof butted against a second side face of said disc opposite to said first side face of said disc, and adjacent the outer periphery of said wheel disc such that:

said disc is held in its peripheral side parts with said first and second split rim members; and

said annular groove is closed on said one opened side thereof by the butted face of said jointing piece of said second split rim member so as to compressibly and fixedly confine said sealing member within said annular groove.

4,102,380

TIRE BEAD BREAKER MACHINE

Charles B. Holder, Bay Springs, Miss., assignor to James A. Sumrall, Bay Springs, Miss.

Filed Apr. 20, 1977, Ser. No. 789,015

Int. Cl.[2] B60C *25/08*

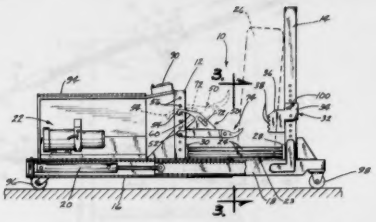
U.S. Cl. 157—1.26 **12 Claims**

1. A tire bead breaker machine comprising,

a frame having horizontally spaced apart upstanding members interconnected by a tire support means,

a rim-holding means on one of said upstanding members for engagement with one side of a tire rim,

a bead breaker arm vertically pivotally connected to said other upstanding member and having a wedge pivotally connected for slight pivotal movement on the outer free



end of said arm for engagement with the other side of a tire rim between the tire bead and rim, said arm having a first stop means for preventing downward pivotal movement while allowing free upward pivotal movement whereby said wedge may follow the contour of the rim as it moves between said rim and tire bead, and power means operatively connected to said arm for moving said wedge between said tire bead and rim.

4,102,381

STRIP CURTAIN

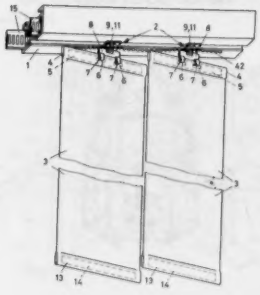
Konrad Bratschi, Muri, Switzerland, assignor to K. Bratschi, Silent Gliss, Muri, Switzerland

Filed Jul. 29, 1977, Ser. No. 820,135

Claims priority, application Switzerland, Aug. 4, 1976, 9959/76

Int. Cl.[2] E06B *9/30*

U.S. Cl. 160—168 R **12 Claims**



1. A strip curtain which includes a curtain track, sliding elements guided in the track and interconnected by a flexible separation limiting means, said sliding elements being adapted to have attached thereto freely hanging curtain strips, and an actuating tape movably positioned within the curtain track, said curtain comprising:

a vertical pivot shaft for each sliding element,

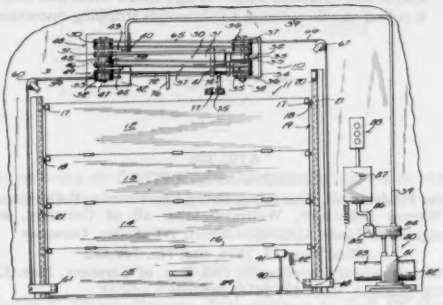
a pinion mounted on each pivot shaft, the pinion being in permanent engagement with the actuating tape, and

the sliding elements having slip coupling means and stop means limiting the pivoting of the curtain strips.

4,102,382
OVERHEAD DOOR OPERATOR

Edwin G. Vesbach, 12011 W. Scherrei Dr., Franklin, Wis. 53132

Filed May 5, 1977, Ser. No. 794,192
Int. Cl.[2] E05F *15/00, 15/08*
U.S. Cl. 160—188 8 Claims

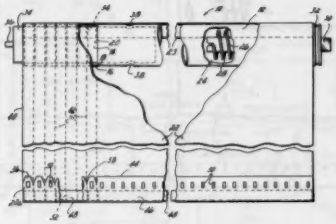


1. Apparatus for opening and closing a door comprising:
a door that is mounted for movement between one position in which it closes an opening and another position generally above the opening,
a fluid actuated device including a cylinder, a piston movable therein and a piston rod,
first sheave means mounted to said piston rod for rotation and for translating with said rod,
second sheave means and stationary means on which said second sheave means is mounted for rotation in spaced relationship with said first sheave means,
cable means looped a plurality of times around said first and second sheave means and having opposite free end portions for being attached, respectively, to spaced apart places on said door,
pump means operative to supply pressurized fluid to said cylinder to extend said piston rod and translate said first sheave means away from said second sheave means to thereby enlarge the size of said cable loops and create tension in said cable for opening said door,
means for closing said door including means for relieving fluid from said cylinder for enabling tension created in said cables by the weight of the door when said door is unclosed, to translate said first sheave means toward said second sheave means and reduce the size of said loops,
an elongated member mounted for translating lengthwise in opposite directions in correspondence with said piston rod,
limit switch operator means mounted to and adjustably positionable along said elongated member,
a plurality of limit switches in the path of travel of said switch operator means for being actuated, respectively, in correspondence with said door reaching its fully open and fully closed positions,
motor means for operating said pump means,
solenoide operated valve means operable to open and cause said relieving of fluid for closing said door when one of said limit switches is not actuated,
means for controlling said valve means to close in response to actuation of said one limit switch when said door reaches the limit of its closing travel,
means for controlling said motor means to start for opening said door, and
means for controlling said motor means to stop in response to actuation of another of said limit switches when said door reaches the limit of its opening travel.

4,102,383
WINDOW SHADE

Gerald W. Miller, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed Oct. 15, 1976, Ser. No. 732,715
Int. Cl.[2] A47G *5/02*
U.S. Cl. 160—263 5 Claims



1. A window shade comprising, in combination,
a roller having a telescoping member receivable in one end,
a shade secured along one end of said roller and extending between the ends of said roller, and having an opposite free end, said shade having a hem opposite said end secured to said roller formed of overlapping shade portions joined along a hem line spaced from the free end of said shade, and having at least one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said edge such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,
said roller including at least at its end receiving the telescoping member a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade adapted to permit removal of discrete lengths of said roller corresponding to said discrete widths of said shade hand-stripped therefrom, and
a plurality of tabs associated with said hem, each said tab extending between said hem line and said free end of said shade, the edges of said tabs being substantially coincident with said hand-strip lines, said tabs being adapted to be grasped and pulled to separate said overlapping shade portions and initiate stripping along said lines from said free end of said shade toward said end secured to said roller while said shade is rolled on said roller.

4,102,384
WINDOW SHADE

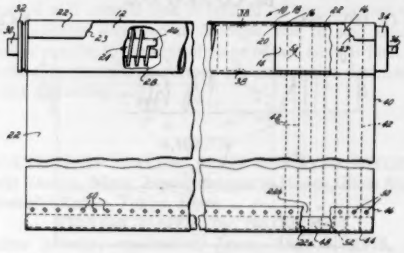
Robert C. Gossling, and Gerald W. Miller, both of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Continuation of Ser. No. 688,063, May 19, 1976, abandoned.
This application Apr. 7, 1977, Ser. No. 785,368
Int. Cl.[2] A47G *5/02*
U.S. Cl. 160—263 13 Claims

1. A window shade comprising, in combination,
a roller having a telescoping member receivable in one end, and
a shade secured along one end to said roller and extending between the ends of said roller and having a free opposite end, said shade having at least at one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said edge such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,
said roller including at least at its end receiving the telescoping member a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade adapted to permit removal of

discrete lengths of said roller corresponding to said discrete widths of said shade hand-stripped therefrom,

said window shade being adapted to be sized to a window opening by hand-stripping of said discrete widths of said



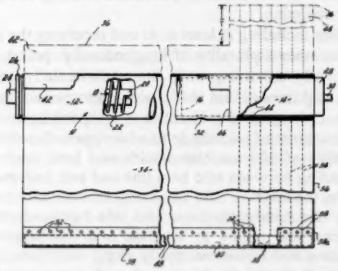
shade from said free end of said shade toward said end secured to said roller while said shade is rolled on said roller, with said discrete length of said roller to be removed being exposed by said hand-stripping of said shade.

4,102,385

WINDOW SHADE

Gerald W. Miller, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed May 23, 1977, Ser. No. 799,350
Int. Cl.[2] A47G 5/02
U.S. Cl. 160—263 **5 Claims**



1. A window shade assembly comprising, in combination, a telescoping roller including a first tubular roller section, a second tubular roller section having one end thereof telescopingly seated within said first section with a portion thereof projecting axially from said first section, a tube surrounding at least a portion of said second member projecting axially from said first member, and means associated with said roller for resisting relative rotative movement between said tubular roller members, said tube having an inside diameter of the sides permitting free axial sliding movement between said members, and

a window shade of flexible sheet material secured along one end to said roller and extending between the ends of said roller and having a free opposite end, said shade having at least at one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said end such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,

said tube being formed by an extended length of shade material wrapped around said projecting portion of said second roller section a number of times sufficient to form an outside diameter approximately equal to the outside diameter of said first roller section, said spaced hand-stripped lines extending to the roller end of said extended length of shade material so as to define when wrapped around said projecting portion of said second roller section a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade,

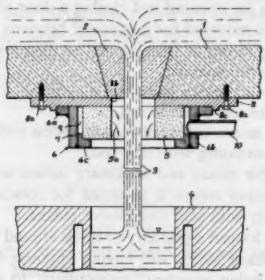
said window shade being adapted to be sized to a window opening by hand-stripping of said discrete widths of said shade from said free end of said shade toward said roller end of said extended length of said shade while said shade is rolled on said roller in a continuous stripping operation.

4,102,386

CASTING APPARATUS

Peter Hildebrandt, Kranzberg; Georg Veranneman, Pullach, and Werner Schottroff, Wolfratshausen, all of Germany, assignors to Linde Aktiengesellshaft, Wiesbaden, Germany

Filed Nov. 12, 1976, Ser. No. 740,832
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550813; Mar. 19, 1976, 2611831
Int. Cl.[2] B22D 21/02, 23/00
U.S. Cl. 164—259 **8 Claims**



1. In a casting apparatus having a source of molten casting metal provided with an outlet, a free-falling stream of molten casting metal flowing downwardly from said outlet, and a mold receiving said stream, the improvement which comprises:

a porous ring of high-temperature-resistant gas-permeable material disposed coaxially with said stream and extending over a minor portion of the length thereof,

means for feeding said ring with a protective gas and forcing said gas through the pores thereof whereby said ring distributes protective gas emerging from the pores of said body all around said stream to shield the same from the ambient atmosphere over an unconfined portion of the length thereof, and

means for connecting said ring directly with said source.

4,102,387

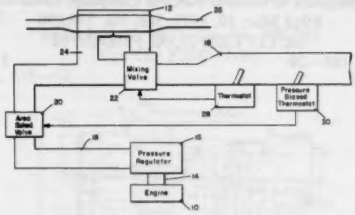
AUTO IGNITION TEMPERATURE CONTROL SYSTEM

Dan S. Matulich, Rolling Hills Estates, Calif., and B. Franklin Saylor, Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 13, 1976, Ser. No. 704,903
Int. Cl.[2] F28F 27/00
U.S. Cl. 165—1 **16 Claims**

1. A temperature control system comprising heat exchanger and flow control means for regulating air temperature within a

predetermined range by controlling relative air flow through and past the heat exchanger, and additional flow control means



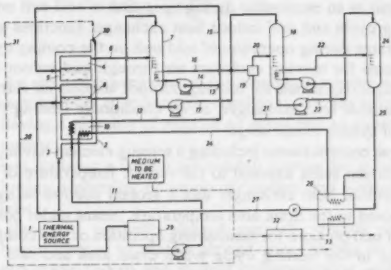
for reducing air flow through said system whenever air temperature exceeds said predetermined range.

4,102,388

HEAT RECOVERY PROCESS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 725,760, Sep. 23, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,470
Int. Cl.[2] F25B *13/00, 15/00*
U.S. Cl. 165—1 **32 Claims**



1. A process for transferring thermal energy comprising contacting steam and a water absorbent solution in a first contact zone under conditions to absorb water and dilute the solution, and raise the temperature of the solution, the solution being in indirect heat exchange with an aqueous stream and raising the temperature of the aqueous stream and converting the aqueous stream to steam and water,

passing diluted solution from the first contact zone to a second contact zone;

passing said aqueous stream to a condensation and separation zone wherein the aqueous stream is separated into steam and liquid water,

passing steam from the condensation and separation zone to a second contact zone wherein the steam is contacted with diluted solution from the first contact zone, under conditions to absorb water and dilute further the solution, and raise further the temperature of the solution,

passing liquid water from the condensation and separation zone in indirect heat exchange with the further-diluted solution in said second contact zone, and converting the bulk of the liquid water into high temperature steam,

passing further-diluted solution from the second contact zone to a third contact zone, and contacting further-diluted solution in the third contact zone with said high temperature steam under conditions

to absorb water, and dilute the further-diluted solution, and form a high temperature, heavily diluted solution, and

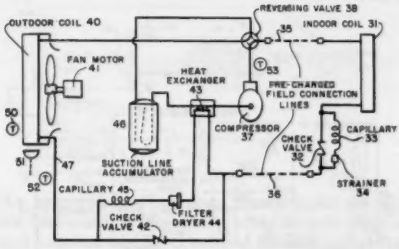
transferring heat from the high temperature, heavily-diluted solution to a medium to be heated.

4,102,389

HEAT PUMP CONTROL SYSTEM

Frank Eugene Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,674
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—29 **8 Claims**



1. A heat pump system including an outdoor coil, an indoor coil, a compressor for receiving low pressure gas from a suction line and for providing high pressure gas to a discharge line, a reversing valve connected in the discharge line, operable in a first position to pass the high pressure gas through the outdoor coil in the cooling cycle and operable in a second position to pass the high pressure gas through the indoor coil in the heating cycle, means for energizing supplemental heat below a balance point temperature and means for energizing standby heat below a minimum set point temperature, a thermostat positioned to sense the temperature in the space served by indoor coil, and a control system connected to regulate operation of the compressor, the reversing valve, and the supplemental and standby heat, which control system comprises:

a timer control circuit, including an input stage for starting the timing interval when an input signal is received, an output stage for delivering an output signal at the expiration of the timing interval, and circuit components including a resistor and a capacitor connected to establish the timing interval duration;

means, coupled between the thermostat and the timer control circuit input stage, for passing an input signal to start the timing interval when the thermostat provides a compressor turn-off command signal;

memory means, having an output connected to regulate compressor operation and an input connected for regulation by the timer control circuit, to insure the compressor cannot be re-started before the expiration of the timing interval; and

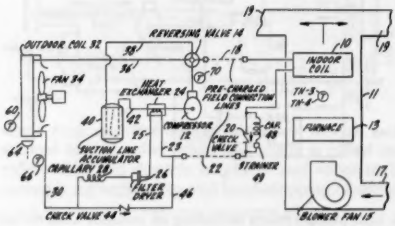
a trigger circuit connected to provide a defrost-cycle initiate signal and to provide a signal to the timer control circuit input stage when the trigger circuit is switched, a pressure-responsive sensor positioned adjacent the outdoor coil and connected to supply a first signal when the pressure across the outdoor coil drops below a predetermined minimum value, an integrating circuit, coupled between the pressure-responsive sensor and a first input terminal of the trigger circuit, for integrating the first signal and passing a signal to the trigger circuit only after the first signal has been present for a predetermined minimum time, a temperature-responsive sensor provided to sense the temperature in the liquid line connected to the outdoor coil, and means for passing a signal from the liquid line sensor to a second input terminal of the trigger circuit, which trigger circuit switches only in response to the simultaneous presence of low-pressure and low-temperature signals at the trigger circuit input terminals.

4,102,390

CONTROL SYSTEM FOR HEAT PUMP AND FURNACE COMBINATION

James Ranck Harnish, and Larry Allan Raffensberger, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,751
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—29 6 Claims



1. A combination heat pump-furnace system for delivering conditioned air to an enclosure comprising: a heat pump including an inside coil, a compressor and an outside coil all connected in series flow relation, said heat pump further including a reversing valve for selectively directing refrigerant from said compressor to said indoor coil for heating mode operation, or to said outdoor coil for cooling mode operation; a furnace having a heat exchanger section upstream from said indoor coil; means for circulating air through said furnace heat exchanger and then through said indoor coil to said enclosure; first thermostatic means for controlling the operation of said heat pump during heating mode operation; second thermostatic means for controlling the operation of said furnace, said second thermostatic means actuating said furnace when the temperature of air in said enclosure reaches a predetermined low threshold level; third thermostatic means between said furnace heat exchanger and said indoor coil for sensing the air temperature off said furnace heat exchanger; and relay means controlled by said third thermostatic means for discontinuing operation of said heat pump on heating mode only after the temperature, as sensed by said third thermostatic means, reaches some predetermined level to thereby prevent a noticeable drop in the temperature of air supplied to said enclosure which may be caused by premature deactivation of said heat pump.

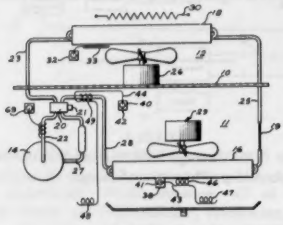
6. A heat pump system comprising: an inside coil, a compressor and an outside coil all connected in series flow relation, said heat pump further including a reversing valve for selectively directing refrigerant from said compressor to said indoor coil for heating mode operation, or to said outdoor coil for cooling mode operation; means for sensing the need for defrosting said outside coil when said heat pump is operating in the heating mode, said means including a defrost cycle termination sensor; means for supplying heat to said enclosure intermittently during the defrost cycle; means for resuming operation of the heat pump in the heating mode without shutting off said compressor for a predetermined period of time after said defrost cycle termination sensor indicates that the defrost cycle has been completed; and means for discontinuing operation of said heat pump after said time has elapsed if the temperature of air being circulated through said indoor coil is not below a predetermined level.

4,102,391

HEAT PUMP FROST CONTROL SYSTEM

Joseph R. Noland, and William M. McCarty, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 10, 1977, Ser. No. 776,194
Int. Cl.[2] F25B 29/00; F25D 21/02
U.S. Cl. 165—29 5 Claims



1. In a self-contained air conditioning unit for heating and cooling an enclosure, a refrigerant circuit including an outdoor heat exchanger and indoor heat exchanger, a compressor, a reversing valve for selectively connecting said compressor to said heat exchangers where by said outdoor heat exchanger functions as an evaporator during operation of said unit on the heating cycle and said indoor heat exchanger functions as an evaporator during operation of said unit on the cooling cycle, fan means for moving enclosure air through said indoor heat exchanger, fan means for moving outdoor ambient air through said outdoor heat exchanger, an air conditioner heating cycle control system comprising:

a frost control means including a sensing element having one portion being exposed to the surface temperature of said outdoor heat exchanger and a second portion being exposed to the drain area temperature, means under control of said portions for maintaining operation of said compressor in the heating cycle when drain area and said heat exchanger surface temperature sensed by said portions are above a preselected frost accumulation level and to de-energize said compressor when either of said portions senses a preselected frost accumulation level.

a second control including a sensing element having one portion being exposed to the line surface temperature of a portion of said refrigerant circuit connecting said outdoor heat exchanger and said reversing valve, and a second portion being exposed to said ambient outdoor temperature, means under control of said portions for maintaining operation of said outdoor fan independent of said first control when both ambient and the line surface temperature sensed by said portions are above a frost accumulation temperature and to complete a circuit to said fan through said first control if either of the portions of said second control senses a preselected frosting temperature to de-energize said outdoor fan when said compressor is de-energized;

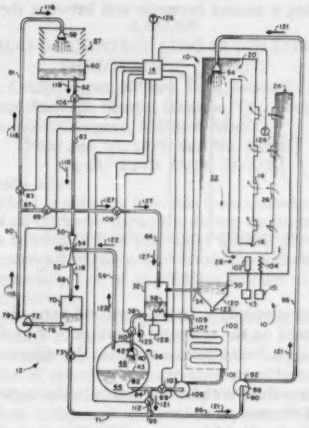
a thermostat means having a first switching means operable for energizing said compressor in said heating cycle when the temperature of said enclosure is a predetermined comfort level, and a second switching means operable for de-energizing said compressor when the temperature of said enclosure drops to a second lower predetermined level during the operation of said compressor in said heating cycle; and

a heating means arranged in the path of air through said indoor heat exchanger being energized by said second switching means when the temperature of said enclosure drops to the second lower preselected temperature.

4,102,392
LOW ENERGY CONSUMPTION AIR CONDITIONING SYSTEM

Theodore S. Schneider, 132 N. Clark Dr., Beverly Hills, Calif. 90211

Filed Jan. 10, 1977, Ser. No. 758,031
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—62 7 Claims



1. An airconditioning system for a building comprising

means defining an exhaust air conduit system for a building having a plurality of exhaust air inlets and an exhaust air outlet,

means defining a supply air conduit system for a building having a plurality of supply air outlets and a supply air inlet,

an elongated, vertically aligned, generally straight conduit tower adapted to contain air and water having its upper end connected to and in fluid communication with said exhaust air outlet of said exhaust air system, and having its lower end connected to and in fluid communication with said supply air inlet of said supply air system,

means defining a supply of water,

means for conveying said water to a location proximate the upper end of said conduit tower for free fall down said conduit tower, whereby said air flow from said exhaust air conduit system is entrained and carried downward with said flow of water and transported to said supply air inlet,

means for cooling said water after falling through said conduit tower comprising,

means for evaporative cooling said water having a supply water inlet nozzle, a chilled water outlet and a warm water vapor outlet,

means for fluidly connecting said supply water inlet nozzle to said supply of water and said water at the bottom of said conduit tower,

means for fluidly connecting said chilled water outlet to said means for conveying water to a location proximate the upper end of said conduit tower,

means for creating a vacuum in said means for evaporative cooling said water comprising

a venturi having an inlet end, an outlet end and a suction inlet,

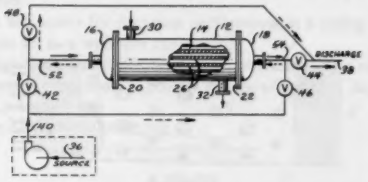
means for moving water through said venturi from said inlet end to said outlet end, and

means for fluidly connecting said venturi suction inlet to said warm water vapor outlet of said means for evaporative cooling said water.

4,102,393
HEAT EXCHANGE APPARATUS

James G. Withers, Jr., Dearborn, Mich., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 617,453, Sep. 23, 1975, Pat. No. 4,007,774.
This application Sep. 17, 1976, Ser. No. 724,036
Int. Cl.[2] F28F *19/00*
U.S. Cl. 165—95 4 Claims

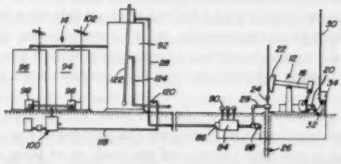


1. An improved heat exchange apparatus for use with a tubeside fluid which is capable of fouling the tube walls comprising at least one tube for circulating fluid through the apparatus, said at least one tube being characterized in that it has integral internal ridging in its inner wall which is generally transverse to the tube axis and has a lead angle of less than 60° as measured from a perpendicular to the tube axis, said ridging being adapted to turbulate said tubeside fluid to prevent fouling of the areas of the tube immediately upstream of the ridging, and valve means for reversing the direction of fluid flow of said tubeside fluid within said at least one tube.

4,102,394
CONTROL UNIT FOR OIL WELLS

Elton M. Botts, Mattoon, Ill., assignor to Energy 76, Inc., Mattoon, Ill.

Filed Jun. 10, 1977, Ser. No. 805,569
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—65 R 8 Claims



1. A control unit for oil well pumping units of the type having a pump jack comprising an AC electric motor powering the pump jack, said AC motor having a variable speed and variable cycle to enable the pump jack to be operated at a speed to operate the down hole pump at a strokes per minute to provide a production capacity of the pump equal to the production fluid flowing from the formation, said variable cycle of the motor enabling the upstroke of the pump to be at a greater speed than the downstroke thereby eliminating pounding due to fluid columns engaged by the pump plunger during its downstroke.

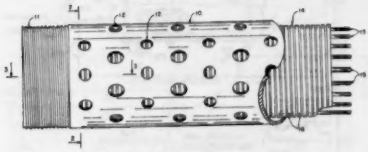
4,102,395
PROTECTED WELL SCREEN

Wiley B. Robinson, Dayton, Tex., assignor to Houston Well Screen Company, Houston, Tex.

Filed Feb. 16, 1977, Ser. No. 768,972
Int. Cl.[2] E21B *43/08*
U.S. Cl. 166—231 2 Claims

1. A well screen assembly for use in a gravel-packed section of a producing well comprising a pipe joint having a plurality of perforations in its side wall through which fluid can flow, a well screen positioned inside the pipe joint, said screen includ-

ing a plurality of elongated rods positioned inside the pipe joint parallel to and spaced from the longitudinal axis of the joint, said rods being arranged in a circle, a length of wire helically wrapped around the rods in spaced-apart turns to provide slots between adjacent wraps to screen solid particles from the fluid flowing through the slots, and means engaging the upper and lower ends of the screen for mounting the screen in the pipe joint with the screen spaced from the inside wall of the pipe joint to provide an annular space between the screen and the



inside wall of pipe joint over substantially its entire length and electrically connected to the pipe joint only through the mounting means to allow fluid passing into the pipe joint through the perforations to flow freely around the screen in the annular space and to allow gravel when pumped around the outside of the well screen to fill the annular space between the well screen and pipe joint, said mounting means closing the annular space adjacent the upper and lower ends of the screen to hold the gravel in position in the annular space between the screen and the inside wall of the pipe joint.

4,102,396

DETERMINING RESIDUAL OIL SATURATION FOLLOWING FLOODING

Robert C. Ransom, Placentia, and LeRoy W. Holm, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Jun. 23, 1977, Ser. No. 809,313
Int. Cl.[2] E21B *49/00*
U.S. Cl. 166—252 **25 Claims**

1. A process for determining the fluid saturation of a subterranean reservoir penetrated by one or more injection wells and one or more production wells, which reservoir has been subjected to a secondary recovery operation in which a secondary recovery fluid is injected through the injection wells comprising:

(a) first injecting into a selected well hydrocarbons in an amount sufficient to resaturate the portion of the reservoir in the immediate vicinity of the well to at least about its original hydrocarbon content,

(b) next injecting into said well a secondary recovery fluid in an amount sufficient to expose said portion of the reservoir in the immediate vicinity of the well to the same volume of secondary recovery fluid as was passed through the bulk of the reservoir during the secondary recovery process, and

(c) thereafter logging the well to determine the fluid saturation.

4,102,397

SEALING AN UNDERGROUND COAL DEPOSIT FOR IN SITU PRODUCTION

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Mar. 7, 1977, Ser. No. 774,597
Int. Cl.[2] E21B *43/24, 43/26;* E21C *43/00*
U.S. Cl. 166—259 **11 Claims**

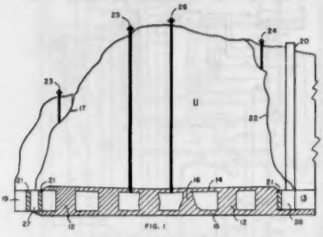
1. A method of producing an underground coal deposit comprising the steps of:

establishing a first communication passage between the surface of the earth and an underground coal deposit,

setting a liner within the said first communication passage, the lowermost point of said liner being positioned apart from the uppermost portion of the said underground coal deposit,

establishing a first hermetic seal between the said liner and the overburden on the periphery of the said first communication passage, the said first hermetic seal being positioned at the lowermost portion of the said liner with the resultant remainder of the annulus between the said liner and the said periphery of the first communication passage being in fluid communication with the earth's atmosphere,

establishing a second hermetic seal between the said liner



and the atmosphere, the said second hermetic seal being positioned on the uppermost portion of the said liner,

establishing a fluid injection means in the uppermost portion of the said liner,

establishing fluid withdrawal means in the uppermost portion of the said liner, then

establishing a third hermetic seal by injecting a fluid in the annulus between the said liner and periphery of the said first communication passage, the said fluid forming a column of fluid in the said annulus above the said first hermetic seal.

4,102,398

METHOD OF FORMING GRAVEL PACKS

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,678
Int. Cl.[2] E21B *43/02*
U.S. Cl. 166—276 **12 Claims**

1. A method of forming a pack of solid particulate material in a well bore penetrating a permeable formation which comprises injecting into the well bore opposite the said permeable formation a slurry of from about 2 to about 10 pounds per gallon of sand having a size of about 20 to about 100 mesh per gallon of carrier liquid to create a permeable pack of said sand against the formation face and wherein in a final step the said pack is electrolessly metal plated to form a consolidated permeable pack thereby minimizing migration of sand and other granular material into the well bore from the said permeable formation, the said sand being copper coated and having an outer coating of a metal selected from the group consisting of cobalt and nickel.

4,102,399

CONSOLIDATED SAND CONTROL PACK

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,677
Int. Cl.[2] E21B *43/04*
U.S. Cl. 166—276 **14 Claims**

1. A method of forming a pack of solid particulate material in a well bore penetrating a permeable formation which comprises injecting into the well bore opposite the said permeable formation a slurry of from about 2 to about 10 pounds of a solid particulate material selected from the group consisting of silicon carbide, silicon nitride, silicon boride, boron carbide, zirconium boride, zirconium carbide, zircon, garnet and mixtures thereof and having a size of about 20 to about 100 mesh

per gallon of carrier liquid to create a permeable pack of said particulate material against the formation face and wherein in a final step the said pack is electrolessly metal plated to form a consolidated permeable pack thereby minimizing migration of sand and other granular material into the well bore from the said permeable formation, the said particulate material being coated with copper and having an outer coating of a metal selected from the group consisting of nickel and cobalt.

4,102,400

METHOD OF CONTROLLING FLUID LOSS FROM THIXOTROPIC CEMENT

Oliver W. Crinkelmeyer, Kilgore, Tex.; Roland L. Root, Tulsa, Okla., and James R. Sharpe, Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 17, 1977, Ser. No. 807,763
Int. Cl.[2] E21B *33/16, 33/138*
U.S. Cl. 166—283 **19 Claims**

1. A method of reducing fluid loss from a thixotropic cement slurry to a subterranean formation during emplacement of said slurry in a borehole which penetrates the subterranean formation to cement a conduit in said borehole, said cement slurry being substantially free of an effective amount of a fluid loss additive, comprising:

(a) temporarily positioning the conduit in the borehole;

(b) providing a fluid comprised of water, a water soluble alkali metal silicate, a water soluble metal compound capable of releasing a multivalent metal cation to react with the water soluble silicate, and a water dispersible cellulose compound and an inert particulate which together impart fluid loss control to the fluid, said fluid components being provided in amounts effective to form a pumpable gel;

(c) injecting said fluid into said borehole so that at least a portion of said fluid contacts the walls of the formation;

(d) injecting said thixotropic cement slurry into said borehole following said fluid and circulating said slurry into position; and

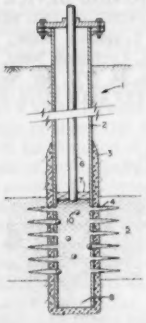
(e) permitting said slurry to set, thereby permanently cementing said conduit into position; the quantity of said fluid contacting said formation being sufficient so that the fluid loss of said cement slurry to said formation is reduced.

4,102,401

WELL TREATMENT FLUID DIVERSION WITH LOW DENSITY BALL SEALERS

Steven R. Erbstoesser, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 6, 1977, Ser. No. 830,729
Int. Cl.[2] E21B *33/10, 43/25*
U.S. Cl. 166—284 **8 Claims**



2. A method of plugging the perforations in a casing which has been set in a wellbore comprising:

downwardly flowing into said casing a carrier liquid having ball sealers suspended therein, said ball sealers having syntactic foam cores and elastomeric covers, said ball sealers having a density less than the density of the carrier liquid and being of sufficient size to plug the casing perforations; and

maintaining the flow velocity of said carrier fluid at a rate sufficient to overcome the buoyancy of said ball sealers and sufficient to transport said ball sealers to the perforations.

4. A ball sealer for plugging perforations in a casing which has been set in a wellbore comprising:

a. a syntactic foam core, said syntactic foam being a material system comprised of hollow spherical particles dispersed in a binder; and

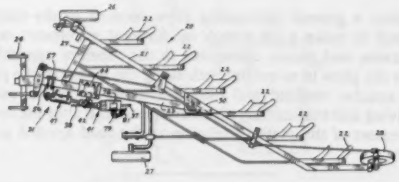
b. an elastomeric covering.

4,102,402

SUBSOILER

Richard W. Steinberg, Mankato, Minn., assignor to Vibra-King, Inc., Mankato, Minn.

Filed Sep. 13, 1976, Ser. No. 722,694
Int. Cl.[2] A01B *11/00*
U.S. Cl. 172—40 **49 Claims**



30. An apparatus for working subsoil comprising: a frame, an earthworking tool adapted to extend into the subsoil in a normal ground working position, link means pivotally connecting the tool to the frame, means mounted on the frame for providing eccentric movement, and connector means attached to the tool and cooperating with the means for providing eccentric movement to move the tool in an endless path and a coulter rotatably mounted on the link means, said coulter being located forwardly of and in longitudinal alignment with the tool, said means mounted on the frame for providing eccentric movement includes inertia wheel means, eccentric means connected to the wheel means providing the connector means with motion in response to rotation of the wheel means, and means for rotating the inertia wheel means, said inertia wheel means comprises a pair of flywheels, and the means for rotating the wheel means includes a power transmission unit having a pair of drive shafts, having a flywheel mounted on each drive shaft, and means to rotate the drive shafts, said eccentric means comprises an eccentric hub secured to each flywheel, and means rotatably mounting the connector on each hub.

4,102,403

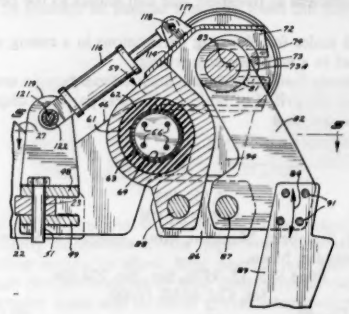
APPARATUS FOR MAKING A SLIT TRENCH

Richard W. Steinberg, Mankato, Minn., assignor to Vibra-King, Inc., Mankato, Minn.

Filed Oct. 15, 1976, Ser. No. 732,796
Int. Cl.[2] E02F *5/18*
U.S. Cl. 172—40 **41 Claims**

1. Apparatus for making a continuous slit trench in the ground to facilitate the laying of linear structures, as lines, pipes, cables and the like, in the ground comprising: a frame having a forward portion adapted to be connected to a pulling vehicle, a body located adjacent said frame, said body having a cylindrical wall forming an opening through the body, means connecting the body to the frame, said means including a cylindrical hub extended through the opening, means mount-

ing the hub on the frame, and an annular resilient and elastic member surrounding the hub and engageable with the cylindrical wall of the body; annular members mounted on the body and engageable with the sides of said annular resilient and elastic member to hold the annular resilient and elastic member under compression; a member located adjacent the body, link means pivotally connecting lower portions of the body and



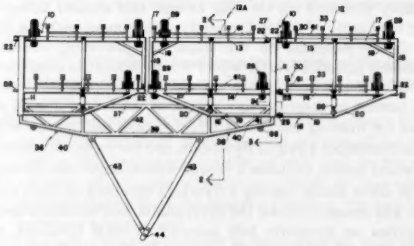
member; a ground penetrating plow secured to the member adapted to make a slit trench on forward movement of the apparatus; and means connected to the member operable to move the plow in an orbital path along the length of the plow, said annular resilient and elastic member being an energy receiving and transmitting member operable to alter the orbital movement of the plow in relation to the load applied to the plow.

4,102,404

ARTICULATED CULTIVATOR

Kelly A. Krammer, Box 144, Cupar, Canada (S0G 0Y0)

Filed Jan. 14, 1977, Ser. No. 759,334
Claims priority, application Canada, Jan. 22, 1976, 244166
Int. Cl.[2] A01B *23/04*
U.S. Cl. 172—310 **20 Claims**



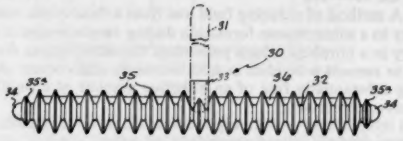
1. A cultivator section adapted to be drawn by a source of power such as a tractor and comprising in combination a main beam extending from the front of said section to the rear thereof and a sub on each side of said main beam, means connecting said sub frames and said main beam for hinging action in a vertical direction of one sub frame relative to the other, further means connecting each of said sub frames and said main beam together for universal articulation of part of each of said sub frame relative to another part of each of said sub frame, cultivating elements secured to and depending from said sub frames, ground engaging wheels supporting said cultivating section, and hitch means for detachably connecting said cultivating section to the associated source of power, each said sub sections including a rear chassis member, a front chassis member situated in spaced and parallel relationship to said rear chassis member and an end chassis member extending between the outer ends of said rear and front chassis members, said rear chassis member and said end chassis member being secured together substantially at right angles to one another, said further means connecting said sub frames to said main beam including a universal joint connection between the inner end of said rear chassis member and the rear end of said main beam and a further universal joint connection between the outer end of said front chassis member and the front end of said end chassis member.

4,102,405

GOLF SAND-TRAP SMOOTHING IMPLEMENT

Edward W. Carman, P.O. Box Elmer, Almond Rd., Elmer, N.J. 08318

Continuation-in-part of Ser. No. 712,202, Aug. 6, 1976, abandoned. This application Nov. 12, 1976, Ser. No. 741,492
Int. Cl.[2] A01B *1/10*; A63B *57/00*
U.S. Cl. 172—378 **7 Claims**



1. A golf sand-trap smoothing implement comprising:

(a) means for penetrating the surface of a sand trap in order to smooth said surface, said penetrating means comprising a unitary substantially cylindrical body having two ends and a longitudinal axis and having integrally formed therewith a plurality of raised ridges spaced along the longitudinal axis of said body and with each of said ridges extending circumferentially around substantially the entire periphery of said body, said ridges each defining an outermost edge which is generally constant in distance from said body along all portions of the circumference thereof, said ridges being relatively rigid and incapable of flexing with respect to said body; and

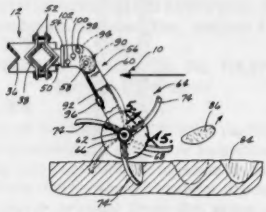
(b) means for drawing said penetrating means through said sand trap just below said surface in order to effect said smoothing operation comprising elongated handle means and extending away from said body at an angle to said longitudinal axis thereof, said handle means being substantially greater in length than the length of said body between said two ends connected to said body.

4,102,406

GROUND CONDITIONING DEVICE AND METHOD OF CONDITIONING SOIL

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Jan. 24, 1977, Ser. No. 761,769
Int. Cl.[2] A01B *35/16, 35/28*
U.S. Cl. 172—540 **3 Claims**



1. A ground conditioning device comprising,

an arm having mounting means at one end for connection to an implement frame,

a plate disc member rotatably mounted to the other end of said arm, said disc member having first and second faces,

a plurality of fastener elements securely mounted to and extending from said first and second faces in circumferentially spaced apart disposition, said fastener elements of said first face staggered circumferentially alternatively from said fastener elements of said second face, said fastener elements being concave longitudinally,

a plurality of ground engaging spikes adapted to adjoin in nesting relationship said fastener elements so as to extend radially from said disc member,

attachment means for detachably mounting said spikes in mating adjoining relationship to said fastener elements, and

said ground engaging spikes being concave in transverse cross section and concave longitudinally to engage and scoop plugs of soil from the ground as said disc member rotates.

4,102,407

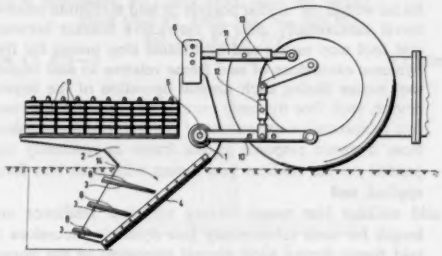
REFORESTATION TILLAGE MECHANISM

István Danszky, Budapest, and Dezsö Szecska, Kecskemet, both of Hungary, assignors to Erdészeti Tudományos Intézet, Budapest, Hungary

Continuation-in-part of Ser. No. 409,258, Oct. 24, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,987

Int. Cl.² A01B *13/08*

U.S. Cl. 172—611 **10 Claims**



1. A reforestation tillage mechanism, attachable to a three-point hitch of a hauling tractor, the mechanism comprising: at least one transverse suspension frame; at least two tiller mechanisms on said frame in a substantially parallel arrangement; three-point hitch connections on said frame for floatingly carrying said tiller mechanisms on the tractor during a tillage operation and for raising the frame for transport; each tiller mechanism comprising blade holder shank having an upper end secured to said frame and being pivotable therewith about said connections in a vertical plane, the main dimension of said shank being substantially normal to the axis about which said frame can pivot; at least one, substantially straight cutter blade removably mounted to a lower forward edge portion of said shank, defining an angle of about 120° to 155°, downwardly inclined with respect to the direction of haulage but opposite thereto; at least one pair of substantially parallel, transversely extending tiller blades removably mounted on opposite sides of said shank behind said cutter blade with respect to the direction of haulage, sloping with respect thereto, and defining an angle of about 10° to 40°, upwardly inclined toward rear free ends of said tiller blades, with respect to the direction of haulage; said holder shank, said cutter blades and said tiller blades forming part of said tiller mechanisms; the aforesaid angles contributing to said tiller mechanisms being floatingly carried while said cutter blades and said tiller blades are partly lowered into the soil, so that said cutter blades and said tiller blades normally till the soil but some large stump can divert said tiller mechanisms upwardly about said hitch, said cutter blades and said tiller blades being then at least partly lifted out of the soil; and weight holder means attached to said frame intermediate said tiller mechanisms to secure removably weight means whereby to increase the weight of the tiller mechanisms and to assist the latter to drop into the soil after the stump has diverted said tiller mechanisms; said cutter blades and said tiller blades being then allowed to drop by the effect of said weight means, whereby to continue the tilling without any breakage.

4,102,408

PILE DRIVING DEVICE

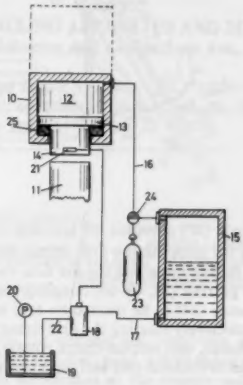
Birger Ludvigson, Södra Vägen 38, Göteborg, Sweden 41254

Filed Feb. 22, 1977, Ser. No. 770,811

Claims priority, application Sweden, Feb. 26, 1976, 76 02300

Int. Cl.² E02D *5/34*

U.S. Cl. 173—2 **13 Claims**



1. A device for displacing an elongate member, for instance a pile by means of a drop hammer, comprising

an — impact cap for transferring impacts from said drop hammer to said elongate member, said impact cap enclosing a cylinder,

a — piston operable in said cylinder to define a gas chamber therein and having a portion extending outside of the cylinder for acting against said elongate member,

a — pressure chamber, separate from the impact cap,

conduit means to communicate said gas chamber and said pressure chamber to form a closed gas volume, pumping means for supplying a pressurized liquid to said pressure chamber and valve means for governing the supply to, and spilling of liquid from said pressure chamber,

a — sensing means adjacent to the end of said elongate member acted upon by the impact cap for converting conditions in said elongate member, dependent upon the resistance met by said member during movements caused by impacts thereon, into transmittable signals, and

means — adapted to receive such signals and to actuate said valve means in response thereto for determining the volume of liquid in said pressure chamber.

4,102,409

ROCK DRILLING MACHINE

John Arne Lagerstedt, Skarholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 9, 1976, Ser. No. 748,733

Claims priority, application Sweden, Dec. 11, 1975, 7513971

Int. Cl.² E21B *1/00*

U.S. Cl. 173—50 **19 Claims**

1. Rock drilling machine comprising:

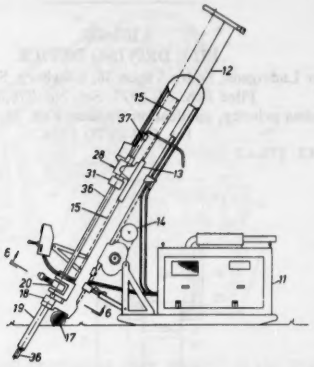
a feed beam (12);

a slide (13) mounted on said feed beam and being movable along said feed beam;

power means (14, 15) coupled to said slide to move said slide along said feed beam;

a first chuck (31) mounted on said slide and having gripping jaws for gripping a drill string (36), said first chuck rotating and feeding the drill string (36) and having a through opening for the drill string;

a motor (34) for rotating said first chuck;



a second chuck (40) mounted on said slide and having gripping jaws for gripping the drill string, said second chuck having a through opening for the drill string;

a reduction gearing (38, 43–46) coupling said second chuck to said motor (34) to be rotated by said motor (34); and

means for selectively rotating the drill string by said first and second chucks, said second chuck rotating the drill string with lower revolution rate and high torque than said first chuck.

4,102,410

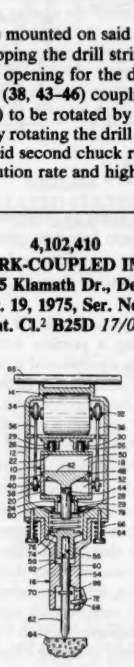
RESILIENT WORK-COUPLED IMPACT DEVICE

Frederick W. Ross, 755 Klamath Dr., Del Mar, Calif. 92014

Filed Mar. 19, 1975, Ser. No. 559,667

Int. Cl.[2] B25D *17/08*

U.S. Cl. 173—133 **32 Claims**



1. An impact device for operation with bias force applied toward a workpiece and comprising:

a frame,

ram means mounted for reciprocation along a selected axis relative to said frame,

power drive means acting between the ram means and the frame for generating the reciprocation of said means by generating reactive reciprocative excursions of said frame along such selected axis,

output means comprising impact tool means operatively mounted in tool guide means for reciprocating movement relative to said frame substantially along such selected axis, said impact tool means positioned for receiving successive impacts from said ram means during reciprocation of the latter, and stop means acting between the frame and the impact tool means for limiting relative travel between the frame and the tool means,

wherein the improvement comprises:

stabilizing means for eliminating frame dynamic impacting against the stop means, for stabilizing the frame reciprocative motion, and for increasing the impact device effectiveness and efficiency with improved hammer-chisel type impacting during operation; said stabilizing means comprising:

said stop means including frame stop means secured on said frame and tool stop means secured on said impact tool means sufficiently spaced respectively along such selected axis for sufficient maximum relative travel between said frame and said impact tool means for free dynamic excursions of said frame relative to said impact tool means clear of substantial contact between said frame stop means and said tool stop means during normal operation of the impact device including operation with such bias force applied and with said impact tool means substantially in constant contact with such workpiece,

resilient bias means operatively interposed between said frame and said impact tool means, said resilient bias means having sufficient spring stiffness and sufficient length to maintain said impact tool means substantially in constant contact with such workpiece during such normal operation of the impact device and to resiliently suspend said frame within the medial portion of said maximum relative travel substantially clear of restrictive contact between said tool stop means and said frame stop means for free dynamic excursions of said frame relative to said impact tool means during each normal operation of the impact device, such free dynamic excursions including the reactive reciprocative excursions of the frame and excursions from dynamic response of the frame as resiliently suspended on the resilient bias means with such bias force applied, and

said resilient bias means having sufficient resilience and length for such substantially free dynamic excursions of said frame during such normal operation of the impact device.

4,102,411

DRILL STEM FOR DRILLING UPWARDLY

Daniel R. Webb, Santa Ana; John F. Steinke, Fountain Valley; Robert W. Berry, Brea, and Stanard R. Funsten, Corona del Mar, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 26, 1976, Ser. No. 717,830

Int. Cl.[2] E21B *3/00*

U.S. Cl. 173—164 **8 Claims**

1. A drill stem section for use in upwardly drilling comprising:

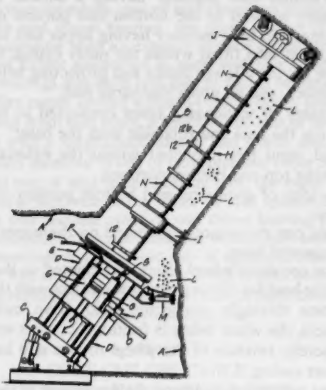
a generally cylindrical shell having threaded pin and box joints on its respective ends;

a circumferential collar disposed about said shell at a location remote from both ends thereof, and being secured to said shell, said collar having at least a pair of circumferentially spaced recesses formed in the outer circumferential edge thereof, whereby said shell may be supported both longitudinally and rotationally by means of said collar; and

said shell having a flat circumferential lower end face formed on the normally lowermost end thereof, and also having a spline connection formed in one of the circumferential surfaces of its normally lowermost end portion;

whereby when the drill stem section is being added to or detached from a drill string it may be vertically supported

underneath said flat lower end face and may be rotatably driven by means of said spline connection, and when it is



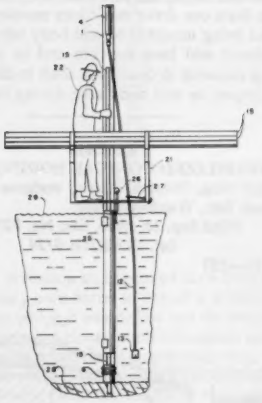
part of a drill string it may be supported both vertically and rotationally from said collar.

4,102,412

APPARATUS AND METHOD FOR PLACING EXPLOSIVES IN SUBMERGED ROCK

Roy N. Sonomura, P.O. Box 1452, Hilo, Hi. 96720

Filed May 17, 1976, Ser. No. 688,551
Int. Cl.[2] E21B *7/12*
U.S. Cl. 175—5 **6 Claims**



1. Apparatus for placing explosives in submerged rock comprising:

a. a rock drilling apparatus having a power driven strut, the terminus of which can be forced against the surface to be drilled and a rock drill with the drill rod and drill head operably attached to the strut for extension of the drill head towards and beyond the terminus of the strut of the strut for drilling holes in rock;

b. a short debris guard tube operably attached in fixed position to the strut so as to extend beyond the terminus of the strut and so as to be coaxial with the drill whereby the strut can force the debris guard against the surface to be drilled to keep both surface debris and drillings out of the hole; and

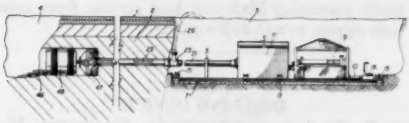
c. an explosives placement tube, the outside diameter of which is slightly less than the drill head and the length of which is greater than the combined depth of the hole to be drilled and the depth of the water at the surface to be drilled; whereby when the hole has been drilled and the drill has been retracted, the drill rod may be deflected and the explosives placement tube inserted into the hole through the debris guard tube with the debris guard tube held against the rock surface by the strut, and the debris guard tube retracted from the surface freeing the drilling apparatus from the explsoives placement tube, leaving the top of the explosives placement tube above the surface of the water.

4,102,413

ROCK DRILLING APPARATUS AND METHOD

Frederick Eric Johnston, 268 Cunningham Ave., Ottawa, Ontario, Canada

Filed Sep. 7, 1976, Ser. No. 720,707
Claims priority, application Canada, Aug. 30, 1976, 260105
Int. Cl.[2] E21B *9/22, 21/00*
U.S. Cl. 175—53 **12 Claims**



1. An apparatus for drilling and removing waste from a drilled hole comprising a drill head, a drill string driven by the drill head, a drill bit located at the remote end of the drill string, a sealing member positionable around the drill string and securable to a face of a rock body through which the hole is to be drilled and a non-rotatable muck extractor securable to the drill bit so that it can be dragged along behind the bit during a reverse drilling operation wherein the muck extractor consists of a cylindrical drum having a frusto conical shaped insert secured therein, and annular resilient sheets around the drum to form, during use, a seal with the hole being drilled during the reverse drilling operation.

4,102,414

DRILLING APPARATUS

Edward A. Bailey, Newport, and James F. Ordway, West Lebanon, both of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Aug. 9, 1976, Ser. No. 712,622
Int. Cl.[2] B25B *23/00*; E21B *19/00*
U.S. Cl. 175—85 **13 Claims**

1. A drilling apparatus comprising:

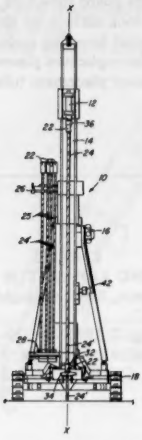
a drill means including an elongated drive portion adapted to have a coupling portion of an elongated drill string secured thereto;

a selectively operable restraining means for restraining such coupling portion from rotation with respect to said drill means;

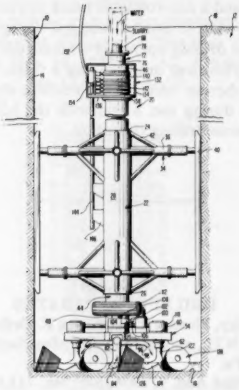
said restraining means including a body member fixedly located with respect to said drill means adjacent said drive portion, and elongated lock means carried by said body member;

said lock means being oriented with a longitudinal extent thereof extending transversely of the axial extent of said

drive portion and being selectively axially movable to engage and disengage such a coupling portion for selectively restraining such coupling portion from rotation with respect to said drill means.

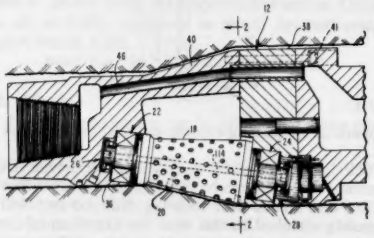


4,102,415
DRILLING DEVICE
Wesley B. Cunningham, 2 Morris St., Charlestown, W. Va. 25301
Filed Feb. 8, 1977, Ser. No. 766,827
Int. Cl.[2] E21B *3/08*
U.S. Cl. 175—96 **7 Claims**



1. Earth drilling equipment for formation of large diameter shafts in earth, rock and the like, said equipment comprising:
- a vertical main body tube having upper and lower ends and an outer side wall, the main body tube having a vertical bore therein;
- a plurality of extensible and retractable jacks on the outer side wall, said jacks being movable into supporting relationship with the shaft to position the tube substantially centrally in the shaft and to fix said tube at vertically adjustable positions within said shaft, and being retractable inwardly to adjust the vertical position of the main body tube;
- an elongated, tubular outer casing extending vertically through the bore of said main body tube, mounted for rotation therein, and having top and bottom end portions projecting outwardly of the upper and lower ends thereof;
- a horizontal base member having a central hub section fixedly secured to the bottom end portion of the outer casing, said base member having upper and lower sides;
- an exhaust tube fitted within the outer casing, said exhaust tube having a lower intake end projecting below the base member, and an upper discharge end;
- a plurality of scavenging tubes connected to exhaust tube below the base and rotatable with the base;
- a fluid input pipe mounted within the exhaust tube, and having top and bottom portions;
- a plurality of spouts on said bottom portion of said input pipe;
- at least one drive motor mounted on the upper side of the horizontal base;
- at least one drive wheel rotatably mounted on the upper side of the base for direct peripheral contact with the shaft, and means drivingly connecting said drive motor to said wheel, the wheel being in frictional contact with the shaft whereby rotation of the wheel rotates said base and said outer casing;
- at least one cutter motor on the upper side of the horizontal base;
- cutter drive axles extending vertically, rotatably through the base and means connecting the axles with the cutter motor;
- a plurality of cutting elements on each of the axles, said cutting elements each comprising a plurality of plates having peripheral cutting edges, being mounted for rotation about their axes and commonly about said axle such that the edges contact the earth or rock to be drilled to grind the same for mixture with the fluids from the input tube spouts to form a slurry for expulsion through said exhaust tube; and
- means on said casing and said main body tube for energizing said at least one drive and cutter motors,
- said jacks being mounted to said body tube outer side wall, just above said base member and in proximity to said cutting elements to cause said shaft to directly resist reaction torques on said body tube during rock drilling.

4,102,416
STABILIZED CONICAL BORING TOOL
Hans Albert Hug, Weston, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.
Filed Sep. 13, 1976, Ser. No. 723,015
Int. Cl.[2] E21B *9/24*
U.S. Cl. 175—227 **13 Claims**



1. A self-advancing conical boring tool comprising:
(a) a tapered frame formed with a plurality of circumferentially disposed recesses;
(b) a pair of thrust bearings mounted within each of said recesses;
(c) a pair of self-aligning spherical roller bearings mounted within each of said recesses, one of each said roller bearings abutting one of each said thrust bearings;
(d) pressure compensating means mounted to said frame

adjacent one of said thrust bearings, said frame formed with a cavity about at least one of said thrust bearings, said pressure compensating means separating said cavity into at least two chambers, one of said chambers communicating with said thrust bearing, the other of said chambers communicating with an exterior surface of said frame;

(e) a roller cutter supported in each said pair of spherical roller bearings and each said pair of thrust bearings, each said roller cutter having a frusto-conical body, stub shafts extending from said body, a longitudinal axis of said body coaxial with a longitudinal axis of said shafts, one of said stub shafts received in one of said spherical roller bearings pair and one of said thrust bearing pair, the other of said stub shafts received in the other of said spherical roller bearing pair and the other of said thrust bearing pair;

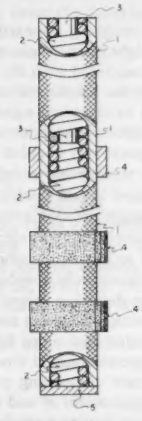
(f) each said roller cutter constrained within each said pair of thrust bearings and each said pair of spherical roller bearings for free rotation about an axis that is both oblique and skewed relative to a longitudinal axis of said frame.

4,102,417

CORE CUT OFF CABLE

W. B. Driver, 19 Sheridan Rd., Arnold, Md. 21012

Filed Nov. 23, 1976, Ser. No. 744,242
Int. Cl.[2] E21B *25/00*
U.S. Cl. 175—253 **3 Claims**



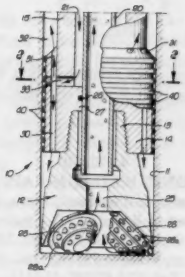
1. Wherein the invention an improved core cut off cable of the type used inside a core barrel to cut off a drilled core from the formation from which it was drilled and the improved core cut off cable comprises, a closed pitch cylindrical spiral coil of wire rod, a wire cable constructed around and along the length of said coil of wire rod, said coil of wire rod providing a hollow core for said wire cable the length of said wire cable, a plurality of abrasive sections adhered to and along one end portion of said wire cable, a hose laid through said coil of wire rod from the end of said wire cable opposite the end of the end portion of said wire cable where said abrasive sections being located to the end portion of said coil of wire rod that extends through the end portion of said wire cable where said abrasive sections being located, a metal cap attaches to and closes the end of said coil of wire rod of the end portion of said coil of wire rod that extends through the end portion of said wire cable where said abrasive sections being located, said metal cap also attaches to the same respective end of said wire cable, cooling and flushing fluids being pumped through said hose into end portion of said coil of wire rod that extends through the portion of said wire cable where abrasive sections being located, said cooling and flushing fluids being forced under pressure between the coils of said coil of wire rod between the wire of said wire cable to the outside of said wire cable to cool said wire cable said abrasive sections and flush cuttings from said wire cable said abrasive sections and where said abrasive section interfaces with said drilled core, said coil of wire rod keeps said wire cable from collapsing and collapsing said hose when a pulling tension being applied to said wire cable, said hose provides a means of providing cooling and flushing fluids to part of said wire cable where said abrasive section being located.

4,102,418

BOREHOLE DRILLING APPARATUS

Archer W. Kammerer, Jr., Columbus, N.C., assignor to Baker-drill Inc., San Angelo, Tex.

Filed Jan. 24, 1977, Ser. No. 761,627
Int. Cl.[2] E21B *17/00*
U.S. Cl. 175—324 **11 Claims**



6. Apparatus for drilling a borehole in an earth formation; comprising a dual drilling string including inner and outer concentric pipe sections providing an annular passage therebetween, a body member connected to said drilling string, a drill bit connected to said body member and having a central passage opening directly into the open end of said inner pipe section to conduct cuttings produced by the bit upwardly through said drill bit and through said inner pipe section, said body member having passageways for conducting fluid from said annular passage simultaneously into the borehole below said body member and outside and above said drill bit and into the borehole above said body member to create a zone of substantial static fluid along the outside of said body member, said body member having longitudinally spaced peripheral ring portions intermediate the outlet ends of said passageways to provide a labyrinth seal around said body member.

4,102,419

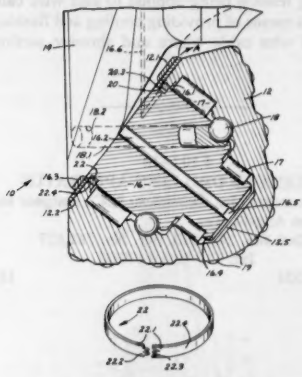
ROLLING CUTTER DRILL BIT WITH ANNULAR SEAL RINGS

Frank J. Klima, 1401 W. Chestnut St., Virginia, Minn. 55792

Continuation-in-part of Ser. No. 684,669, May 10, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,089
Int. Cl.[2] E21C *13/00*; E21B *9/10*
U.S. Cl. 175—371 **9 Claims**

1. A rotary drill bit having a journal, a rolling cutter having a recessed open end for reception of the journal, and interior anti-friction bearings rotatably mounting the cutter on the journal, the journal and the cutter having spaced, circumferential, confronting surfaces adjacent the open end of the cutter with one of the surfaces having an annular groove therein, and sealing ring means comprising annular, spring-loaded sealing ring spring means having at least a pair of axially aligned sealing rings having split ends staggered circumferentially of the journal to define a labyrinth seal pressed against and car-

ried by the other circumferential surface and extending into and sealing against the annular groove to seal the interior



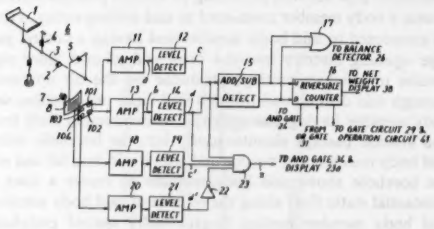
anti-friction bearings from contamination by drill cuttings or the like and to restrain escape of internal lubricants.

4,102,420

ELECTRONIC WEIGHING APPARATUS

Noboru Uyama, Osaka, and Katsuaki Hara, Tondabayashi, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Oct. 8, 1976, Ser. No. 730,942
Claims priority, application Japan, Dec. 10, 1975, 50-148188
Int. Cl.[2] G01G *19/413*
U.S. Cl. 177—25 **20 Claims**



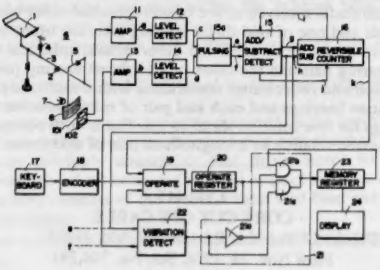
1. An electronic weighing apparatus, comprising: means responsive to the weight of an article being weighed for causing a displacement corresponding to the weight of said article, electrical signal providing means responsive to the displacement of said displacement means for providing an electrical signal corresponding to the displacement of said displacement means and thus to the weight of said article, said displacement means assuming an initial position of displacement if and when no article is placed on the apparatus, display means responsive to said electrical signal for displaying the weight of said article, initial position detecting means operatively coupled to said displacement means for indicating by a respective output signal that said displacement means has reached said initial position of displacement, initial state resetting means responsive to the initial position detected output signal from said initial position detecting means for resetting said electrical signal providing means to an initial state, said initial state resetting means comprising initial reset switch means, means responsive to simultaneous outputs from said initial position detecting means and from said initial reset switch means for providing a resetting signal, and means responsive to said resetting signal from said resetting signal providing means for resetting said weight associated electrical signal to the initial value.

4,102,421

ELECTRONIC WEIGHING APPARATUS

Tsutomu Ozaki, Amagasaki, and Kazuyoshi Enomoto, Kawachinagano, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jan. 5, 1977, Ser. No. 757,021
Claims priority, application Japan, Jan. 14, 1976, 51-4237
Int. Cl.[2] G01G *23/10, 23/22, 3/14*
U.S. Cl. 177—185 **10 Claims**



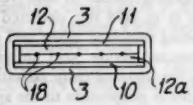
1. An electronic weighing apparatus, comprising: means responsive to the weight of an article being weighed for causing a displacement associated with the weight of said article, means responsive to the displacement of said displacement means for providing an electrical signal representing the displacement of said displacement means and thus the weight of said article, means operatively coupled to said electrical signal providing means for storing said weight associated electrical signal, means responsive to said electrical signal storing means for displaying the weight of said article, vibration detecting means operatively coupled to said electrical signal providing means for detecting an undesired vibration of said displacement means, means operatively coupled to said storing means and to said vibration detecting means and responsive to the output from said vibration detecting means for preventing said weight representing electrical signal from being stored in said storing means for a predetermined time period, said electrical signal providing means comprising pulse generating means responsive to the displacement of said displacement means for generating a pulse train having a number of pulses representative of the displacement of said displacement means, counter means operatively coupled to said pulse generating means for counting the number of pulses in said pulse train, said displacement means being adapted to cause displacement in a first direction in response to a relative increase in the weight of the article and to cause displacement in a second direction in response to a relative decrease in the weight of the article, said pulse generating means being adapted to generate a first pulse train responsive to the displacement of said displacement means in said first direction and to generate a second pulse train responsive to the displacement of said displacement means in the second direction, said vibration detecting means comprising signal output means responsive to sequential generation of said first pulse train and to said second pulse train in the stated order for providing a vibration representing output for a predetermined time period, said signal output means comprising storing means assuming a first state in response to said first pulse train and assuming a second state in response to said second pulse train, delay means coupled to said storing means for delaying one state output of said storing means for a predetermined time period, and means coupled to said delay means and the other output of said storing means for providing a logical product of the output from said delay means and the other output of said storing means.

4,102,422

DEVICE FOR MEASURING LOADS, ESPECIALLY TRANSIENT LOADS

Per Lennart Christiansson, Lund, Sweden, assignor to Telub AB, Sweden

Filed Apr. 8, 1976, Ser. No. 674,972
Claims priority, application Sweden, Apr. 8, 1975, 7503998
Int. Cl.[2] G01G 19/02, 3/14
U.S. Cl. 177—210 C 10 Claims



1. A variable capacitance device for sensing and measuring loads, especially transient loads, wherein the capacitance varies as a linear function of the loads to be measured, said device comprising:

(a) two conductive plates,

(b) an elastic dielectric layer between said plates,

(c) means encompassing said device for compressing said two conductive plates toward each other and for maintaining pressure on said conductive plates to preload said dielectric layer to cause the capacitance of the device to vary as a linear function of the loads to be measured,

(d) a plurality of conductive threads embedded in said dielectric layer,

(e) a first electrode of the device connected to said threads, and

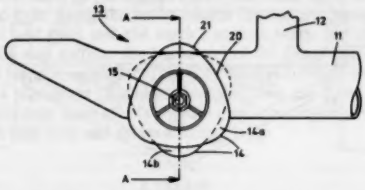
(f) a second electrode of the device connected to one of said plates.

4,102,423

GROUND TRACTION DEVICES

Peter Reid, Hardington Mandeville, Near Yeovit, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed May 26, 1977, Ser. No. 800,848
Claims priority, application United Kingdom, May 28, 1976, 22461/76
Int. Cl.[2] B62D 57/00
U.S. Cl. 180—7 R 10 Claims



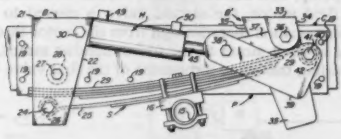
1. A ground traction device comprising, in combination, a fixed axis, ground engaging means mounted for rotation on said fixed axis, means for rotating said ground engaging means on said axis, said ground engaging means including first and second parts, each part having a peripheral surface comprised of a plurality of individual arcs each of similar radius that is greater than a shortest distance between said axis and said surface, curved lobe portions blending ends of adjacent arcs and having a radius less than said distance, said first and second parts comprising solid rubber tires rotationally fixed with respect to each other and rotationally offset about said axis, said rubber tires being constructed of a rubber having a hardness selected in relation to a weight of a structure to be moved so that when operating over hard ground, the curved lobe portions are automatically compressed to assume a radius approximating that of the arcuate portions, whereby said ground engaging means operates automatically as a circular wheel when moving over hard ground.

4,102,424

TAG WHEEL LIFT

Alvin L. Heinze, Weld County, Colo., assignor to Hydraulics Unlimited Manufacturing Co., Eaton, Colo.

Filed Jul. 8, 1977, Ser. No. 813,847
Int. Cl.[2] B62D 61/12
U.S. Cl. 180—24.02 10 Claims



1. A tag wheel lift for a truck or the like having a chassis, at least one drive wheel at each side of said chassis, mounting means including spring means for supporting said chassis from said drive wheels, at least one tag wheel at each side of said chassis and spaced longitudinally from said drive wheels, and spring means for said tag wheels, whereby said tag wheels, when in use, may support a portion of the load on said chassis, said lift comprising:

first bracket means attachable to said chassis at each side thereof and having a connection for one end of a spring means for the corresponding tag wheel;

second bracket means attachable to said chassis and having a pivot for an upper link means;

lower link means pivotally connected at one end of said upper link means and having a lower end provided with a connection for said spring means for the corresponding tag wheel;

said upper and lower link means being movable from a retracted position in which the connection of said tag wheel spring means to said lower link means lifts said tag wheel above the road and an extended position in which said end of said tag wheel spring means is in a lowered position to cause the corresponding tag wheel to engage the road and support, through said tag wheel spring means, a portion of the load on said chassis; and

hydraulic means for moving the pivotal connection between said upper and lower link means, to move said upper and lower link means between said retracted and extended positions.

4,102,425

FRONT WHEEL DRIVE SYSTEM FOR A VEHICLE

Howard A. Marsden, Pekin, and Willard J. Haak, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 23, 1977, Ser. No. 780,559
Int. Cl.[2] B60K 17/10
U.S. Cl. 180—66 F 8 Claims

1. a drive system for a wheel of a vehicle comprising:

a fluid pump;

a first valve;

first conduit means interconnecting the pump and first valve;

a fluid motor operatively associated with a wheel of the vehicle;

second conduit means interconnecting the first valve and motor;

a second valve;

third conduit means interconnecting the motor and second valve;

fourth conduit means communicating with the second valve;

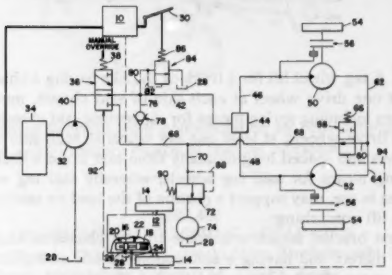
the first valve being movable to provide fluid communication therethrough from the pump through the first conduit means through the second conduit means, to the motor;

the first valve being movable to block communication therethrough from the pump through the first conduit means through the second conduit means to the motor;

the second valve being movable to provide fluid communication therethrough from the motor through the third conduit means, to the fourth conduit means;

the second valve being movable to block communication therethrough from the motor through the third conduit means, to the fourth conduit means;

means operatively interconnecting the first and second valves for providing that upon movement of the first valve to provide fluid communication therethrough from the pump, first conduit means, second conduit means, to the fluid motor, the second valve is moved to provide communication therethrough from the motor through the third conduit means to the fourth conduit means, and for providing that upon movement of the first valve to block



communication therethrough from the pump, first conduit means, second conduit means to the fluid motor, the second valve moves to block communication therethrough from the motor through the third conduit means to the fourth conduit means;

wherein the means operatively interconnecting the first and second valves comprise additional conduit means, wherein introduction of fluid pressure therein moves the first and second valves to provide fluid communication therethrough respectively, and wherein release of fluid pressure therefrom provides movement of the first and second valves to block communication therethrough respectively; and

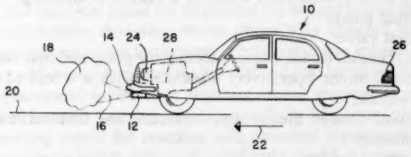
further comprising vehicle transmission means operatively associated with the additional conduit means and including means for providing introduction of fluid pressure into the additional conduit means, and for providing release of fluid pressure from the additional conduit means.

4,102,426

VEHICULAR SAFETY DEVICE

Michael Dennis Walden, 709 Sammon Ave., Toronto, Ontario, Canada (M4C 2E3)

Filed Jun. 4, 1976, Ser. No. 692,724
Int. Cl.[2] G08G *1/00*
U.S. Cl. 180—98 **1 Claim**



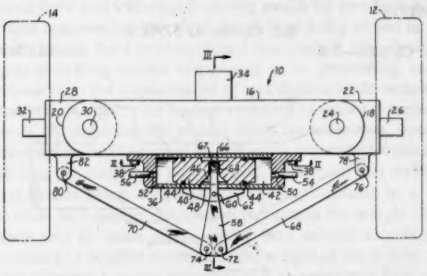
1. A vehicular safety device comprising fog detecting means for the detection of fog in the pathway of a vehicle, said fog detecting means carried by a frontmost portion of said vehicle, said fog detecting means utilizing rays emanating outwardly and forwardly from said vehicle directed over a roadway carrying said vehicle, said fog detecting means including means to detect said rays reflected from said fog when said fog is located in front of said vehicle and above said roadway, said fog detecting means for controlling apparatus means of said vehicle in a fog detected mode and a lack of fog detected mode, said fog detecting means being disposed in said fog detected mode when said rays are reflected from said fog towards said frontmost portion of said vehicle, said apparatus means including automatic braking means and automatic speed control means and visual signalling means and frontmost lamp control means, said automatic braking means utilized for the application of braking forces to said vehicle when said fog detecting means is in said fog detected mode, said applied braking forces being removed when said detecting means is in said non fog detected mode, said automatic braking means including means for automatically adjusting the amplitude of said braking forces in proportion to the speed of travel of said vehicle, said automatic speed control means limiting the speed of the motor of said vehicle when said fog detecting means is in said fog detected mode, said automatic speed control means being inoperable when said fog detecting means is in said non fog detected mode, said visual signalling means visibly signalling trailing vehicles located behind said vehicle by intermittently operating at least one lamp secured to a rear surface of said vehicle when said fog detecting means is in said fog detected mode, said visual signalling means becoming inoperable when said fog detecting means is in said non fog detected mode, said frontmost lamp controlling means for altering the lighting mode emanating forward of said vehicle from a lamp located on a front surface of said vehicle into a fog lighting mode when said fog detecting means is in said fog detected mode, said frontmost lamp control means for altering said lighting mode to a non fog lighting mode when said fog detecting means is in said non fog detected mode.

4,102,427

COMPACT STEERING AXLE ASSEMBLY

Charles J. Sabec, Chagrin Falls, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 28, 1977, Ser. No. 791,906
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—156 **14 Claims**



13. A steering axle assembly for steering wheels of a vehicle, comprising:

(a) an elongated main frame;

(b) a pair of steering knuckles, each of said knuckles rotatably supporting one of the wheels and pivotally secured to one end of said main frame for rotation about said one end;

(c) a hydraulic cylinder rigidly fixed to said main frame and having a port on each end for receiving hydraulic fluid through each said port and an opening between the ends of said cylinder;

(d) a piston slidable within said cylinder and having walls defining a radial recess tapering inwardly from said opening;

(e) a bracket connected to the outside of said cylinder;

(f) link means, coupled at one end to said piston and extending from said recess and said opening to another end

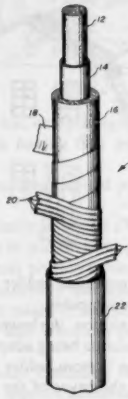
outside said cylinder, said link means being connected to said bracket by a pivot about which said link means is rotatable, wherein said one end of said link means supports a roller in abutment with said walls; and p1 (g) a pair of rods, each pivotally connected at one end to said other end of said link means and pivotally connected at another end to one of said steering knuckles.

4,102,428

NO-FLASH SEISMIC CORD

Stanley R. Kelly, Simsbury, Conn.; John P. O'Brien, and William C. Morrow, both of Littleton, Colo., assignors to Ensign-Bickford Company, Simsbury, Conn.

Filed Nov. 3, 1976, Ser. No. 738,347
Int. Cl.[2] G01V *1/06*; C06C *5/00*
U.S. Cl. 181—116 **10 Claims**



1. In a seismic explorative system using a linear detonating cord as a seismic source with the cord resting on top of the earth's surface in essentially an uncovered condition, the improvement wherein the linear detonating cord is a high core load nonincendive cord providing enhanced useful seismic energy and reduced background noise, comprising an elongated core of detonating explosive having a core load of about 100–400 grains per foot, a layer encircling said core and consisting essentially of particulate flame quenching material adjacent said core along the entire length thereof and positioned between said core and the earth's surface when the cord is resting on said surface, the load level of the flame quenching material being about equal to the core load of the explosive and having a load level of about 100–450 grains per foot, and a flame retardant outer sheath confining and protectively enclosing both said core and said encircling layer.

4,102,429

APPARATUS FOR GENERATING SEISMIC WAVES

Clifford D. Dransfield, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 10, 1976, Ser. No. 740,645
Int. Cl.[2] G01V *1/04, 1/06*
U.S. Cl. 181—117 **8 Claims**

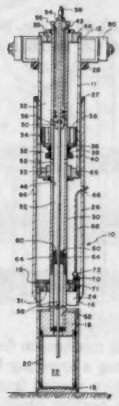
7. In an apparatus for controlling the movement of a seismic wave generator of the type adapted to impart a seismic pulse to the earth and thereafter rebound upwardly, the improvement comprising:

(a) a support frame suspended above the earth;

(b) an upstanding, cylindrical guide member dependently attached to said support frame;

(c) an upstanding seismic generator cylinder positioned beneath said guide member in axial alignment therewith;

(d) a cylindrical sleeve fixed to the top of the generator cylinder and extending upwardly therefrom so as to engage the external surface of said guide member for a limited, slidable, telescoping movement therebetween, the diameter of said sleeve being substantially equal to that of said generator cylinder; and



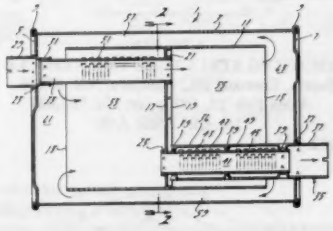
(e) dashpot means within said guide member operably interconnected with said generator cylinder and adapted to hydraulically damp the movement thereof.

4,102,430

PERIPHERAL RETURN FLOW MUFFLER

George T. Wilson, Oregon, Wis., assignor to Tenneco, Inc., Racine, Wis.

Filed Aug. 11, 1977, Ser. No. 823,629
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—265 **6 Claims**



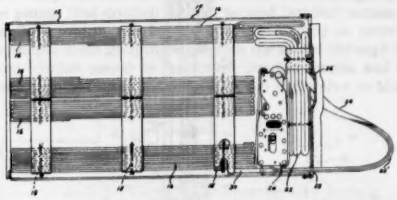
1. A muffler for attenuating sound in pulsating gas flow systems, such as exhaust systems of internal combustion engines, comprising an outer tubular shell closed at opposite ends and having an inlet at one end and an outlet at the other end, a tubular inner shell positioned within the outer shell and open at each end, said inner shell being radially spaced inwardly from the outer shell to provide longitudinal gas passage means extending between the two shells for the full length of the inner shell and providing a gas flow passsage innerconnecting opposite ends of inner shell, a transverse partition within the inner shell and subdividing it into an inlet chamber and an outlet chamber, an inlet tube connecting said inlet to the inlet chamber and extending through the outlet chamber, an outlet tube connecting the outlet to the outlet chamber and extending through the inlet chamber.

4,102,431

EMERGENCY PERSONNEL LOWERING APPARATUS

Charles E. Carroll, Kettering, and William H. Hobbs, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 13, 1977, Ser. No. 815,136
Int. Cl.[2] A62B 1/14
U.S. Cl. 182—5 6 Claims



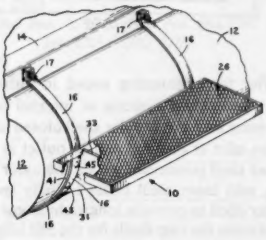
1. A lowering control mechanism for use in controlling the descent of a person along a lowering line, comprising: a support frame, including two spaced frame members, with said lowering line having a portion passing through the support frame between the frame members; a pair of aligned elongated slots in said frame members; a descent control mechanism within said support frame; said descent control mechanism including a bearing member; a plurality of first guide rollers on one side of said elongated slots; a plurality of second guide rollers on the opposite side of the elongated slots from said first guide rollers; said lowering line passing through said support frame along a path across said bearing member and around at least one of said first guide rollers and at least one of said second guide rollers, whereby the lowering line has at least two sections crossing the space between the elongated slots; means connected to said bearing member and engaging said elongated slots for controlling movement of the bearing member in a direction along the longitudinal axis of said slots; means connected to said bearing member for changing the contact area between the sections of the lowering line crossing the space between the elongated slots; means for securing the lowering control mechanism to a person using the lowering control mechanism.

4,102,432

STEP MOUNTING STRUCTURE FOR VEHICLE TANKS

Leopold Bustin, Emmans Rd., Flanders, N.J. 07836

Filed Feb. 11, 1977, Ser. No. 767,688
Int. Cl.[2] B60R 3/00
U.S. Cl. 182—92 4 Claims



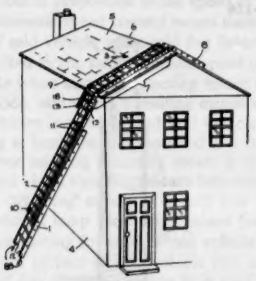
1. A step for mounting on a strap supported tank comprising:
step means;
at least one bearing plate, said bearing plate defining a plane which corresponds in shape to the surface of said tank, and at least one dimple formed in said bearing plate; and
brace means for rigidly securing said step means to said bearing plate, said bearing plate being shaped to be received between said tank and said strap for supporting said tank, said bearing plate being shaped to be in surface-to-surface contact with said tank and said strap.

4,102,433

LADDER

Leslie Van Valkenburgh, Rte. 42, Westkill, N.Y. 12492

Filed Feb. 18, 1977, Ser. No. 769,965
Int. Cl.[2] E06C 1/12
U.S. Cl. 182—164 9 Claims

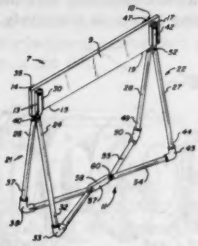


1. A multiple section extension ladder for access to and use on a roof of a building comprising:
a rigid bottom ladder section, the lower side of the length of the bottom ladder section being adapted to face the side of a building when the bottom ladder section extends from the ground to near the eaves of the roof;
a flexible top ladder section adapted for use upon the roof of a building having
a plurality of relatively shorter ladder subsections disposed in an end-to-end arrangement and adapted to overlie the upper side of the length of the bottom ladder,
a plurality of hinges, the hinges connecting a different pair of adjacent ladder subsections to one another, each hinge having a pivotal axis adjacent the lower side of the flexible top ladder section to enable the shorter ladder subsections to fold about the hinges in a direction extending toward the bottom ladder section and to prevent the shorter ladder subsections from folding in a direction away from the bottom ladder section,
one relatively longer rigid ladder subsection adapted to overlie the upper side of the length of the bottom ladder,
additional hinges attached to the bottom end portion of the rigid ladder subsection and the top end portion of the shorter ladder subsections, the longer ladder subsection when in place on top of a roof being adapted to extend from the ridge of a roof and down the far side of a roof with respect to the bottom ladder section, the shorter ladder subsections when in place on top of a roof extending along the side of the roof adjacent the bottom ladder section between the ridge and the eaves of the roof wherein one or more of said relatively shorter subsections can extend below the eaves of the roof,
means for slidably mounting the lower side of the length of the flexible top ladder section to the upper side of the length of said rigid bottom ladder section in a facing relationship; and
means for slidably moving said flexible top ladder section with respect to the rigid bottom ladder section.

4,102,434
COLLAPSIBLE SAWHORSE

Paul C. Blank, Del Camino Park, Rte. 4, Space 103, Longmont, Colo. 80501

Filed Feb. 7, 1977, Ser. No. 766,111
Int. Cl.[2] F16M 11/00
U.S. Cl. 182—181 11 Claims



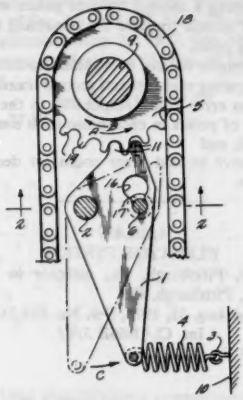
1. A sawhorse device, comprising:
an elongated beam having first and second opposite end portions;
guide means on said opposite end portions of said elongated beam;
a first support assembly including a top portion receivable in said guide means at said first end portion of said elongated beam and a bottom portion having a pair of spaced feet;
a second support assembly including a top portion receivable in said guide means at said second end portion of said elongated beam and a bottom portion having a pair of spaced feet; and
feet connecting means extending between said feet of said first and second support assemblies, said feet connecting means having opposite end portions engaging different ones of said feet and a central portion that is raised at least slightly with respect to a plane through the bottom of said spaced feet.

4,102,435
MECHANICAL SAFETY UNIT ON SPINDLE-DRIVEN LIFTS

Dionys Hofmann, Darmstadt-Marienhohe, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Continuation of Ser. No. 548,810, Feb. 10, 1975, abandoned.
This application Jul. 30, 1976, Ser. No. 710,158
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408717
Int. Cl.[2] B66F 7/28
U.S. Cl. 187—8.5 11 Claims

1. An apparatus for latching against upward movement a spindle driven lift of the type having a lifting nut on which a lifting carriage guided in a column is supported and a safety nut mounted for movement on the spindle for guiding the column in the event of the lifting nut failure comprising
a pawl member,
means rotatably mounting said pawl member adjacent the spindle so that said pawl member in a locking position prevents rotation of said spindle in the direction which causes upward movement of said lift, and

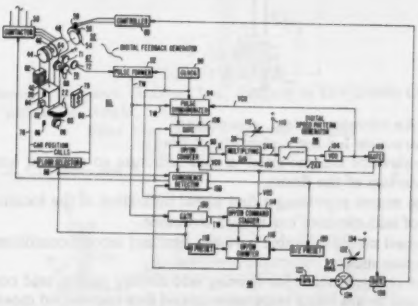


means responsive to failure of said lifting nut for causing said pawl member to shift to said locking position.

4,102,436
ELEVATOR SYSTEM

Andress Kernick, Franklin Township, Westmoreland County; Richard J. Ravas, Monroeville, both of Pa., and Manvel A. Geyer, Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 640,300
Int. Cl.[2] B66B 1/30
U.S. Cl. 187—29 R 24 Claims



1. An elevator system comprising:
a building having a hoistway,
an elevator car mounted for movement in said hoistway, said elevator car to be stopped at a predetermined stopping point from any initial speed at and below a predetermined maximum speed, at a predetermined rate of deceleration,
detector means, including means mounted in said hoistway, said detector means providing a position signal when said elevator car is a predetermined distance D from the stopping point,
means providing a first train of pulses responsive to movement of the elevator car, with each pulse indicating a predetermined increment of car movement,
first counter means providing a count responsive to the distance the elevator car should be decelerated according to its present speed,
second counter means providing a count indicative of said distance D, said counter means being decremented by said first train of pulses responsive to said detector means providing said position signal, means providing a coinci-

dence signal when the count on said second counter means is equal to the count of said first counter means,

said first counter means, in response to said coincidence signal, initiating a second train of pulses at the rate the elevator car should traverse the remaining increments to the stopping point,

said second counter means, in response to said coincidence signal, comparing said first and second trains of pulses and providing an error count responsive to the difference in the number of pulses in each pulse train since the coincidence signal, and

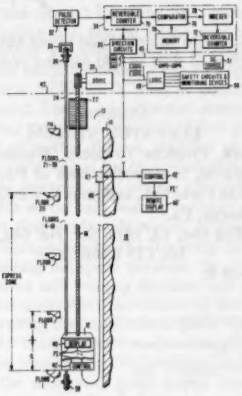
means responsive to said error count for decelerating the elevator car.

4,102,437

ELEVATOR SYSTEM

Alan F. Mandel, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1976, Ser. No. 719,211
Int. Cl.[2] B66B 3/02
U.S. Cl. 187—29 R **10 Claims**



1. An elevator system, comprising:

a structure having a plurality of floors,

an elevator car mounted in said structure to serve at least certain of the floors,

first means providing a first signal indicative of the location of said elevator car in said structure,

second means operable between first and second conditions,

display means,

and control means for driving said display means, said control means being responsive to said first and second means, said control means providing signals for said display means which cause said display means to indicate the location of the elevator car in the structure in response to both the first and second conditions of said second means, with the indicated location of the elevator car being more specific with respect to at least one of the floors when said second means is in its second condition than when it is in its first condition.

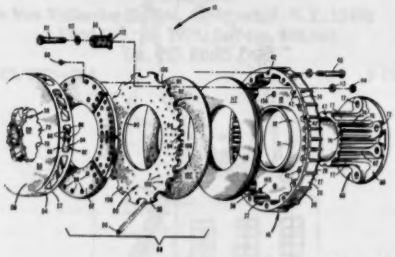
4,102,438

DISC BRAKE ASSEMBLY

Yvon Rancourt, Quebec, Canada, assignor to The Dolphin Brake Corp., Sunrise, Fla.

Filed Oct. 18, 1976, Ser. No. 733,340
Int. Cl.[2] F16D 55/40
U.S. Cl. 188—18 A **36 Claims**

1. A disc brake assembly for a vehicle wheel, the assembly comprising, in combination: a brake housing defining an interior chamber; mounting means for securing said housing to a vehicle; an annular brake disc mounted within said housing, said disc having at least one planar braking surface; attachment means for associating said disc with a vehicle wheel for rotation therewith; at least one brake shoe means disposed within said housing on the planar braking surface side of said disc and mounted for axial movement toward and away from said disc; fluid controlled actuating means disposed within said housing for moving said brake shoe means toward said disc and in braking engagement therewith; fluid inlet means for delivering fluid to said actuating means, to selectively move said brake



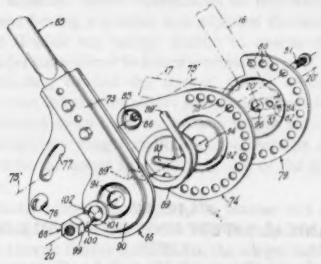
shoe means toward said disc; wherein each of said brake shoe means includes an annular backing plate, a brake lining secured to one surface of said backing plate for engagement with the adjacent planar braking surface of said disc, and guide means on the outer periphery of each said backing plate; and further comprising cooperating guide means on the inner surface of said housing for cooperating with the guide means on said backing plates and for guiding said backing plates toward and away from said disc without rotation relative to said housing.

4,102,439

TORQUE REACTION OPERATED BICYCLE BRAKING SYSTEM AND MOUNTING STRUCTURE

Franklin James Calderazzo, Norwalk, Conn., assignor to Richard N. Jayson, Old Greenwich, Conn., a part interest

Continuation-in-part of Ser. No. 690,922, May 28, 1976. This application Feb. 11, 1977, Ser. No. 767,893
Int. Cl.[2] B62L 3/00
U.S. Cl. 188—24 **26 Claims**



1. As an article of manufacture for motional pick-off proportioned to instantaneous rear-wheel braking torque on a bicycle, first and second plates having registering rear-axle mounting apertures for mounting over one end of a bicycle rear axle, one of said plates having a slot arcuate about the axis of axle mounting, first motional pick-off connection means carried by the other plate and extending through the slot and retaining said plates in rotationally displaceable face-to-face relation to an arcuate extent permitted by the slot, the adjacent faces of said plates having coacting coil-spring locating recessed formations for locating a coil spring substantially concentric with the rear-axle mounting apertures, such recessed formations including a tangential extension in one plate and an opposite tangen-

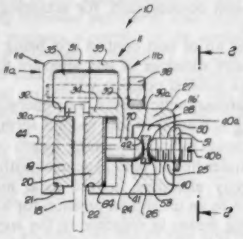
tial extension in the other plate, a coil spring in retained assembly to said formations and with tangential ends in said extensions, said coil spring torsionally preloading said connection means against an end of the arcuate slot, second motional pick-off connection means carried by said one plate at substantially the slot radius and near said one end of the slot, means on one of said plates adapted for antirotational engagement to a part of the bicycle frame, and means on the other of said plates adapted for caliper-brake mounting of a rear-wheel brake for limited angular displacement against said preload and within the arcuate extent of the slot.

4,102,440

CAM OPERATED DISC BRAKE

William H. Wood, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed Apr. 11, 1977, Ser. No. 786,131
Int. Cl.[2] F16F *55/08*
U.S. Cl. 188—72.7 **10 Claims**



1. In a disc brake assembly, the combination comprising

(a) a frame including a caliper, and brake pads carried thereby in laterally spaced relation to receive a disc therebetween,

(b) first and second members located for relative lateral displacement of effect displacement of the pads relatively toward one another, thereby to brake the disc, there being a lateral axis,

(c) a part in the form of a lever extending between said members, one of the members comprising an elongated plunger having a convex nose received in a first wedging bearing formed by said part, said bearing defining a concave recess in said part, the recess being dish shaped,

(d) means on the frame supporting said part for wedging movement between said members tending to shift said bearing for effecting said relative displacement of the members to brake the disc, said supporting means including a pivot for said lever offset from said axis, the pivot carried by the frame, and

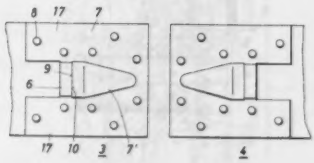
(e) said frame including a first hollow section located laterally of the caliper to receive said part and said plunger nose and a second section located in offset relation to said axis to be intersected by planes passing through said pads and perpendicular to said axis, said second section acting to stiffen said caliper, said frame defining a wall through which said plunger projects, the plunger being cylindrical to define said axis centrally intersecting said nose and recess, the plunger and its nose being freely rotatable about said axis, there being a bearing at said wall supporting the plunger for rotation thereof, the frame and the pad closest to said plunger defining flats which interfit to operatively block rotation of said pad relative to the frame.

4,102,441

FLEXIBLE RESILIENT BRAKE BAND ASSEMBLY

Ernst Kohlhage, Bühl, Baden, Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Buhl, Germany

Continuation of Ser. No. 671,097, Mar. 29, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,885
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515788
Int. Cl.[2] F16D *49/08*
U.S. Cl. 188—77 W **14 Claims**



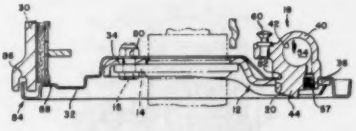
1. A brake band assembly for a wrap-around brake comprising a metal band having a pair of ends, a friction lining carried by said metal band, means for actuating and supporting the brake band assembly, at least one support member for said means, said support member being mounted on said band at an end thereof, and at least one securing strap securing said support member to said metal band, said support member comprising at least two separate parts including a shell narrower than the end width of the metal band and formed of a material more wear-resistant than the material of the securing strap, and a collar-like portion of said securing strap at least partly encircling said shell.

4,102,442

DRUM BRAKE

James J. Colpaert, Granger, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 4, 1977, Ser. No. 793,581
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—206 A **2 Claims**



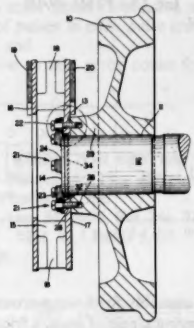
1. In a drum brake having a backing plate which supports a hydraulic actuator and a pair of brake shoes movable by the hydraulic actuator into a braking position, the pair of brake shoes having an inner periphery which defines a central space, the improvement wherein said pair of brake shoes terminate in one pair of ends which engage said hydraulic actuator, said backing plate including a first portion which attaches to an axle assembly and is disposed radially within the central space, and a second portion extending radially therefrom, said second portion supporting the hydraulic actuator in order to position said one pair of ends substantially outside said second portion of said backing plate, said hydraulic actuator carrying at least one resilient member engaging said pair of brake shoes to bias said one pair of ends into engagement with said hydraulic actuator, said hydraulic actuator supporting said pair of brake shoes, and a shield is secured between said hydraulic actuator and said second portion of said backing plate.

4,102,443

DISC MOUNTING RING

William H. Kohler, Delaware, Ohio; James P. Mulder, Oakland, and Michael C. Meslink, Ramsey, both of N.J., assignors to Abex Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,443
Int. Cl.[2] F16D 65/10
U.S. Cl. 188—218 XL 5 Claims



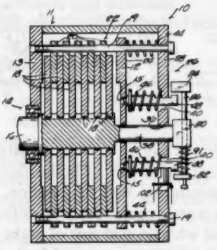
1. A mechanism for mounting a brake disc on a rotatable member by mounting bolt assemblies, wherein the member has a plurality of threaded bores for receiving mounting bolts and the disc has a plurality of mating holes for receiving the mounting bolts, characterized in that the disc mounting holes are radially elongated to permit radial movement of the brake disc relative to the mounting bolts, that the bolt assemblies include spring means mounted on said bolts for tensioning the bolts and that a mounting ring is provided between the brake disc and the spring means to isolate the disc from the spring means and prevent transmittal of radial movement of the disc to the spring means and mounting bolts.

4,102,444

STEPPED TORQUE ROTARY MOTION BRAKE

Karl Palme, Greendale, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 16, 1976, Ser. No. 751,647
Int. Cl.[2] F16D 65/30; B60T 7/12
U.S. Cl. 188—72.1 8 Claims



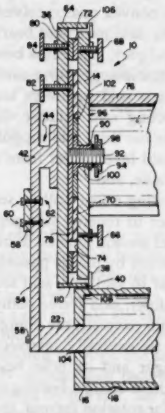
1. A rotary motion brake comprising, in combination,
a frame including a rear mounting plate and a hub journaled within said rear mounting plate,
a brake disc assembly comprising at least one rotatable disc secured to said hub for coincident rotation therewith and at least one stationary disc rotatably fixed with respect to said rear mounting plate,
a pressure plate disposed adjacent and operatively associated with said brake disc assembly for movement into and out of engagement with said brake disc assembly to alternately brake said rotatable disc against and release said rotatable disc for rotation, and
operator assembly means comprising
a front plate secured in fixed relation to said rear mounting plate, and including an aperture and an outer shoulder bordering said aperture,
an axially movable guide rod including an inner end portion having spring retaining means and guide means for moving against said pressure plate, and an outer end portion which slidably axially extends outwardly through said aperture, said outer end portion having a notch including an outer lip engageable with said outer shoulder,
first spring means actuable for generating a first force biasing said pressure plate into engagement with said brake disc assembly,
second spring means supported on said guide rod and compressed between said spring retaining means and said front plate, and actuable for generating a second force in addition to said first force for biasing said pressure plate into engagement with said brake disc assembly,
electromagnetic means connected to said front plate and operative, when energized, for moving said pressure plate out of engagement with said brake disc assembly, and when de-energized, for actuating said first spring means,
said outer lip of said control rod being engageable with said outer shoulder of said aperture to hold said guide rod in a latched position when
said electromagnetic means is de-energized, thereby preventing actuation of said second spring means, and
governor means including caming means operable for moving said outer lip out of engagement with said outer shoulder thereby affording inward axial movement of said guide rod to an unlatched position for actuating said second spring means in response to the speed of rotation of said rotatable disc being reduced to a predetermined lower speed after actuation of said first spring means, whereby said brake affords a stepped application of first and second retarding torques to gradually brake rotation of said rotatable disc.

4,102,445

DOUBLE CABLE REEL

Fred Eurom, 1541 SW. 47th Ter., Ft. Lauderdale, Fla. 33317

Filed Sep. 14, 1977, Ser. No. 833,092
Int. Cl.[2] H02G 11/02
U.S. Cl. 191—12.2 R 8 Claims



1. A double reel cable comprises a reel including a pair of

flanges and a cylindrical core, one of said pair of flanges having a first pair of metallic washers fixedly secured to a lateral surface thereof, said first pair of metallic washers being disposed in concentric relationship, a cover plate, a second pair of metallic washers, said cover plate being disposed in parallel spaced apart relationship with said one of said pair of flanges, said second pair of washers being disposed fixedly secured to a lateral surface of said cover plate located adjacent to said one flange of said pair of flanges, said first pair of washers and said second pair of washers being disposed in juxtaposed touching electrical engagement, said reel being journaled to said cover plate about an axle rod, said axle rod being disposed coaxially aligned with first said pair of washers, a first pair of electrical terminals, said first pair of electrical terminals electrically coupled to said first pair of washers, said first pair of electrical terminals being disposed fixedly secured to said one flange of said pair of flanges, a second pair of electrical terminals, said second pair of electrical terminals, said second pair of electrical terminals being disposed electrically coupled to said second pair of washers, said second pair of electrical terminals being disposed fixedly secured to said cover plate, said one flange of said pair of flanges and said cover plate are being nonelectrically conducting, a cylindrical drum, said cylindrical drum journaled about an axle having a longitudinal axis coaxially aligned with the longitudinal axis of the cylindrical surface of the said cylindrical drum, said longitudinal axis of said cylindrical drum being disposed parallel to said longitudinal axis of said first pair of washers, a portion of the surface of a rubber-like O-ring being disposed in touching frictional engagement with a portion of said surface of said cylindrical drum, a double-wound helical groove being located in said surface of said cylindrical drum, a cam follower rod, one end of said cam follower rod being configured so as to be complimentary shaped with said double-wound helical groove and residing thereinto, a generally U-shaped rod, said cam follower rod having an opening therein, said generally U-shaped rod being disposed secured to said axle about which said cylindrical drum is journaled, an arm, one end of said arm secured to said axle carrying said cylindrical drum, the other end of said arm being disposed removably secured to a block, said block being disposed secured to an outermost lateral surface of said cover plate, an annular groove being located in said block, said annular groove being disposed concentrically aligned with said longitudinal axis of said first pair of annular washers.

4,102,446

HYDRAULICALLY OPERATED CLUTCH

Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

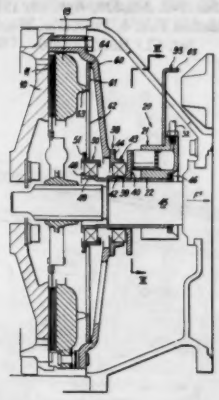
Division of Ser. No. 435,580, Jan. 22, 1974, Pat. No. 3,907,085. This application Jun. 19, 1975, Ser. No. 588,229

The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.

Int. Cl.² F16D *25/08*

U.S. Cl. 192—91 A **13 Claims**

1. In a clutch, a clutch assembly comprising a reaction plate adapted to be fixed for rotation, a friction disc axially movable with respect to said reaction plate and adapted to be fixed to a shaft for rotation independently of said reaction plate, a pressure plate disposed opposite said reaction plate from said friction disc and movable axially in relation to said reaction plate, elastic means normally urging said pressure plate against said friction disc for clamping said friction disc between said pressure plate and said reaction plate, clutch release means includng a first rotating member, said first rotating member including a lever pivotally mounted for relieving the spring force exerted by said elastic means for unclamping said friction disc, a second rotating member, a sleeve mounted for axial movement on said shaft, fluid-operated means comprising a piston member and a cylinder member, said fluid-operated means being exclusively mounted freely on said sleeve, one of said piston and cylinder members normally in abutment at one end of said sleeve, a thrust bearing disposed between said other of said piston and cylinder members and one of said rotating members and adapted to bear thereagainst in response to actuation of said fluid-operated means, and another thrust bearing normally in abutment at the other end of said sleeve and acting against said other of said rotating members, whereby in re-



sponse to the actuation of said fluid-operated means said piston and said cylinder members effectively urge said thrust bearing towards each other thereby pivoting said pivotally mounted lever of said first rotating member to relieve the spring force and unclamp said friction disc.

4,102,447

CLUTCH RELEASE BEARING

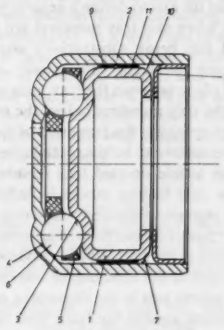
Wilhelm Fischer, Gochsheim, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 783,063

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613731

Int. Cl.² F16D *69/00*

U.S. Cl. 192—110 B **9 Claims**

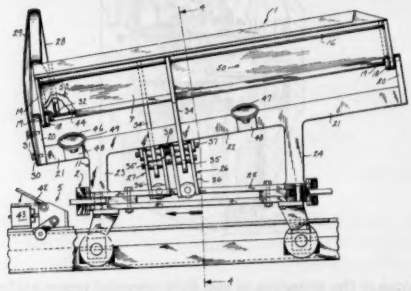


1. In a clutch release thrust bearing comprising an inner rotor disk, an outer cup-shaped rotor disk, a cage holding rolling elements and positioned axially between said inner and outer disks, and a ring in the bore of the outer disk for holding the elements of the bearing together, the inner and outer disks having aligned axially extending portions defining a narrow annular gap; the improvement comprising a friction-reducing material in said gap on one of said disks and substantially but not completely filling said gap, whereby relative radial displacement of said disks is minimized.

4,102,448
CONVEYING APPARATUS INCLUDING TILTING SUPPORT STRUCTURES

David W. Wolbrink, and Richard L. Speaker, both of Hartford, Wis., assignors to S I Handling Systems, Inc., Easton, Pa.

Continuation of Ser. No. 242,330, Apr. 10, 1972, abandoned. This application Feb. 4, 1977, Ser. No. 765,708
Int. Cl.[2] B65G 43/00
U.S. Cl. 198—365 26 Claims



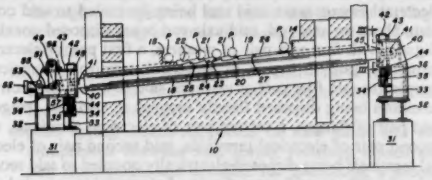
1. An apparatus for transporting articles along a substantially horizontal path and for dispensing articles at an unloading station along said path comprising a first tray member, a second tray member, a carriage means mounted on wheels and having a front end, a pivot support means secured to said carriage means and to said tray members, said pivot support means defining a tilt axis for at least one of said tray members, said tilt axis extending lengthwise of the tray members, means for holding the tray members in a transport position, each of said tray members including a laterally extending support surface disposed above said tilt axis in the transport position thereof, each support surface including first and second interconnected portions each of which extend outwardly and upwardly with a different predetermined angular orientation with respect to said tilt axis to define a generally V-shaped load support assembly when said tray members are in the transport position, said tilt axis being substantially angularly oriented relative to said path and being substantially angularly orientated in a vertical plane between the tray members and locating the front end of the tray members below the rear end thereof, a front wall means spanning the front end of the tray members and projecting thereabove to hold an article thereon, means for gravity biasing an article on said tray members toward said front wall means, said biasing means including said tilt axis being tilted with respect to a plane containing the axis of said wheels and with respect to said path in an amount sufficient to gravity bias an article on said support assembly toward said front wall means and in the direction of transporting whereby the biasing of an article aids in the dispensing of said article by positioning the article against the front wall means.

14. A conveying apparatus comprising, a support carriage, a tray member pivotally mounted on said carriage, a releasable latch means for supporting the tray member in a transport position, said latch means including a latch member on said tray member, a latch lever pivotally attached to the carriage and having a latch leg releasably coupled to the latch member by a pin and notch connection means, a bearing means secured to the latch leg in spaced relation to the pin and notch connection means, and a support bracket secured to the carriage with said bearing means thereon to transfer the load on the lever to the bracket.

4,102,449
WALKING BEAM CONVEYING APPARATUS AND METHOD

Steve Shufran, North Versailles Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 10, 1976, Ser. No. 722,173
Int. Cl.[2] B65G 25/04
U.S. Cl. 198—774 3 Claims



1. In a structure in which elongated cylindrical articles are handled, said structure including entry and exit troughs and a walking beam conveying apparatus for carrying articles from said entry trough to said exit trough, said conveying apparatus comprising:

a plurality of elongated parallel stationary beams extending from said entry trough to said exit trough;

a plurality of elongated parallel movable beams extending from said entry trough to said exit trough; and

means on said beams providing article-receiving notches;

the combination therewith of an improved mechanism for operating said movable beams, said mechanism comprising:

independently operable means at opposite ends of said beams for raising and lowering said movable beams at both ends simultaneously to advance articles from one set of notches to the next or for raising and lowering said movable beams at their entry ends only to introduce articles from said entry trough to the beams without advancing articles already occupying said notches;

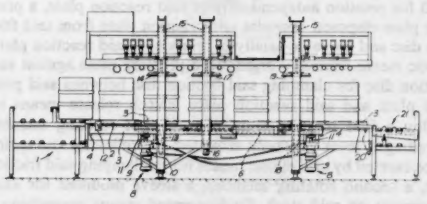
means on said beams providing sloping surfaces extending from said entry trough to said notches to receive articles for storage; and

means operatively connected with said movable beams for moving them axially.

4,102,450
CONTAINER WASHING AND/OR FILLING MACHINES

Christopher P. Chapman, and Owen Clarkson, both of Rochester, England, assignors to Burnett & Rolfe Limited, Rochester, England

Filed Sep. 17, 1976, Ser. No. 724,093
Claims priority, application United Kingdom, Sep. 23, 1975, 39003/75
Int. Cl.[2] B65G 25/02
U.S. Cl. 198—774 7 Claims



1. In a container handling machine including a base frame, a walking beam conveyor for moving the containers step-wise through said machine, said walking beam conveyor including a horizontally extending walking beam assembly, and two spaced-apart upright pneumatic rams for raising and lowering

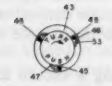
said walking beam assembly, the improvement futher comprising at least two double-acting hydraulic piston and cylinder assemblies, each having a head end and a base end and forming upper and lower hydraulic chambers respectively on opposite sides of the piston slidably mounted within said cylinder, mounting means for mounting said hydraulic piston and cylinder assemblies vertically at spaced-apart locations between said walking beam assembly and said base frame of said machine, and conduit means cross-connecting a head end of one of said cylinder assemblies to a base end of another of said cylinder assemblies to place an upper chamber of one assembly in direct fluid communication with a lower chamber of another of said cylinder assemblies, and vice-versa; whereby, the pistons are constrained to move in unison by the movement of hydraulic fluid between said assemblies to thereby cause the horizontal attitude of said walking beam assembly to be strictly maintained during operation of the upright pneumatic rams in raising and lowering the walking beam assembly.

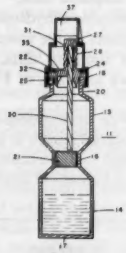
4,102,451

MIXING VIAL

John W. Clarke, Indianapolis, and Galer J. Miller, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 25, 1977, Ser. No. 800,366
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 **10 Claims**





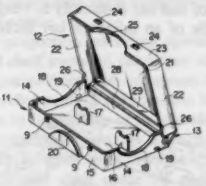
1. In a mixing vial having an upper compartment with an open end, a lower compartment with a closed end and a restricted cylindrical portion therebetween having a cylindrical seal plung isolating said compartments from each other, the improvement comprising a stopper sealing said vial's open end, said stopper having an intergrally formed compressible hollow sleeve, a rigid rod slidably positioned through said stopper with an inner end secured within said sleeve, and a cap removably mounted over said stopper, said cap having a cylindrical lower base portion with an opening defined by an inwardly extending flexible ledge, and a cylindrical upper plunger portion having a top wall slidably extending through said opening and maintained in an upper position by a plurality of ribs on said plunger portion which rest on said base ledge, said ledge having a plurality of cutouts dimensioned to permit passage of said ribs therethrough to bring said plunger in contact with said sleeve containing said rod.

4,102,452

STORAGE CASE

Masaaki Sato, Hachioji, and Shoichi Saito, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,859
Claims priority, application Japan, Dec. 25, 1974, 50-4169[U]
Int. Cl.[2] B65D *43/16, 51/04, 85/67*
U.S. Cl. 206—387 **11 Claims**



1. A storage case comprising:
a box-shaped case body having a front side plate, right and left side plates, internal rear side plate and bottom plate which define an upwardly directed opening;
a covering having an upper plate, right and left side plates and front side plate, said upper plate closing said opening of said case body and simultaneously said right and left side plates and front side plate of said covering overlapping said right and left side plates and front side plate of said case body when said covering is closed;
a rear side plate formed integrally with said case body and covering to enable said covering to be tilted relatively to said case body thereby permitting closing of the case;
an engaging mechanism including a first engagement section provided for an outer face of said front side plate of said case body and a second engagement portion provided for an inner face of said front side plate of said covering and, when said covering is closed, engaged with said first engagement section to prevent said covering from being opened; and
a shifting mechanism position distally from said engaging means for shifting said covering toward said rear side plate including a pair of projections provided respectively on lower ends of outer faces of each of said side plates of said case body adjacent said rear side plate and leaving abutment faces facing toward said rear side plate respectively, said mechanism further including a pair of notches provided respectively, in lower ends of said right and left side plates of said covering so that when said covering is being closed it is shifted toward said rear side plate by abutment and engagement of said pair of notches on and with said rearward abutment faces of said pair of projections, said notches and said abutment faces disengaged when said case is opened.

4,102,453

NESTING AND STACKING CONTAINER

James C. Carroll, and Lewis T. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1976, Ser. No. 700,705
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 **17 Claims**

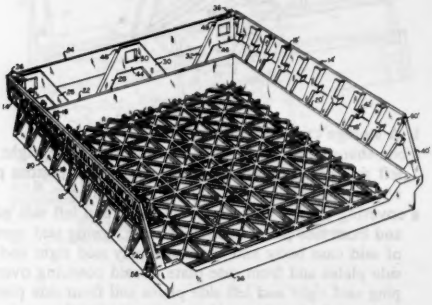
1. A nesting and stacking container of integrally molded construction comprising:
a generally rectangular horizontal bottom and opposed first and second walls projecting upwardly from said bottom, each said wall comprising:
an upper rail member located above said bottom, spaced vertically therefrom, parallel therewith and located in a vertical plane outside the outer edge of said bottom;
a plurality of bar members connecting said bottom with said upper rail, all said bars being located in a vertical plane

inside the vertical plane of said rail member, parallel therewith, and outside the outer edge of said bottom, said bars in said plane being inclined in the same direction at the same angle and spaced one from the other a distance at least equal to the width of said bars;

a stacking foot on the bottom of each bar; and

a stacking saddle on the top of each bar, each such stacking saddle being adapted to receive a stacking foot;

the angle of inclination of said bars being such that the stacking foot of one bar is directly in vertical line with the stacking saddle of an adjacent bar inclined toward said one bar;



whereby an upper container will stack vertically on a like oriented lower container with stacking saddles of the lower container receiving stacking feet of the upper container, and will nest with said lower container without relative rotation of said container when said bars of said upper container are positioned between said bars of said lower container, such that at nest position with said lower container, the lower edge of said upper rail member of said upper container is in register with the upper edge of the like upper rail of said lower like container.

4,102,454

CONICAL DISPOSABLE MUG

Juhani Karevaara, Hameenlinna, Finland, assignor to Hubtamaki Oy, Hameenlinna, Finland

Filed Apr. 27, 1977, Ser. No. 791,596
Int. Cl.[2] B65D *21/02, 3/28*
U.S. Cl. 206—514 **1 Claim**

1. A disposable drinking container formed to be stacked with respect to similar containers, and to form a plurality of stacked containers one within another, said container including: a bottom wall, a conical shaped side wall extending upwardly from said bottom wall, a handle secured to the exterior of said side wall being formed of two flat co-acting members; said handle being secured to said side wall in parallel relation thereto and being adapted to bend outwardly; several protuberance means disposed on the outer periphery of said side wall disposed above and below said handle, said protuberance means being spaced apart from one another projecting outwardly for an amount equal to that of the thickness of said handle therebetween, whereby, each of said containers in stacked relation form an annular chamber circumscribed by respective protuberance means of an inner container and inner wall surface of an outer container; and said handle being disposed within said chamber.

4,102,455

RADIOASSAY KIT FOR METHOD OF DETERMINING METHOTREXATE

Stanley E. Charm, and Henry E. Blair, both of 136 Harrison Ave., Boston, Mass. 02111

Continuation of Ser. No. 650,690, Jan. 20, 1976, Pat. No. 4,043,759. This application Dec. 23, 1976, Ser. No. 753,852
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] A61B *19/00*; A61K *43/00*
U.S. Cl. 206—569 **8 Claims**

6. A methotrexate radioassay kit for the determination of methotrexate in biological fluids by the competitive binding of I^{125} labeled and unlabeled methotrexate to the enzyme dihydrofolate reductase, and the determination of the methotrexate in the sample by comparison of displacement of the bound-labeled methotrexate to the displacement by known methotrexate standards, which kit comprises in containers:

a. an aqueous buffer solution containing a phosphate buffering agent for a pH of about 6.2 at which the determination is to be carried out;

b. a nonhuman serum solution adapted to be mixed with the buffered solution to provide, prior to use, a buffered serum solution for determining standard data on known methotrexate levels;

c. an aqueous, water-soluble, organic solvent solution of a labeled I^{125} methotrexate derivative adapted to be added in known quantities to the sample and to obtain standard data;

d. a solution containing a known amount of methotrexate which is adapted to be diluted by the buffered solution for the preparation of standard data;

e. A solution of the enzyme dihydrofolate adapted for addition in known amounts to the sample and known methotrexate to prepare standard data, and for competitive binding with known amounts of I^{125} methotrexate in the sample; and

f. a gelatin-, dextran- or hemoglobin-treated, charcoal, particulate sorbent material which is adapted to sorb preferentially free unbound methotrexate, whereby the amount of methotrexate in a biological fluid sample may be determined.

4,102,456

KIT FOR THREE-DIMENSIONAL PLASTIC OBJECTS

Betty Jean Morris, Brookfield, Wis., assignor to K & B Innovations, Inc., Brookfield, Wis.

Filed Jan. 21, 1977, Ser. No. 761,409
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—575 **4 Claims**

1. A kit for making a three dimensional object of plastic includes:

(a) at least one sheet of shrinkable plastic which when subjected to a suitable temperature condition will soften and shrink;

(b) a supply of particulate material which will not soften and shrink when subjected to the plastic sheet softening and shrinking temperature conditions; and

(c) means for adhering the particulate material to selected

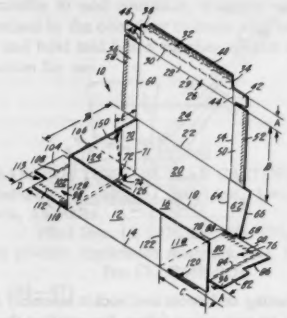
portions of the plastic sheet so that when the particulate material is adhered to the plastic sheet and the plastic sheet is subjected to softening and shrinking temperature conditions the plastic sheet softens and shrinks and the selected portions of sheet coated with the particulate material bulge outwardly to form three dimension object.

4,102,457

CARTONS FOR ICE CREAM AND THE LIKE

George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 20, 1977, Ser. No. 808,182
Int. Cl.[2] B65D 5/54
U.S. Cl. 206—611 14 Claims



1. In a paperboard carton for ice cream having an upstanding front wall, a bottom wall hinged to said front wall, an upstanding rear wall hinged to said bottom wall, a top cover panel hinged to the top of said rear wall, a front cover panel downwardly hinged to the front edge of said top cover panel and overlapping the upper portion of said front wall when the carton is closed, said front cover panel having regions separated by a pair of spaced upper and lower weakness lines substantially parallel to the hinge line between said top cover panel and said front cover panel into an upper cover front skirt region, an intermediate detachable region, and a lower margin region adhesively attachable to the outside of said front wall, a pair of corner glue tabs rearwardly hinged to opposite ends of said front cover panel, a pair of cover end skirt panels downwardly hinged to opposite ends of said top cover panel, a pair of rearward inner end wall panels forwardly hinged to opposite ends of said rear wall, a pair of front inner end wall panels rearwardly hinged to opposite ends of said front wall, and a pair of upstanding end walls hinged to opposite ends of said bottom wall, the improvement comprising:

each said end wall having a weakness line substantially parallel to its hinge line and dividing each said end wall into two regions, an upper margin region and a lower end panel adjacent said bottom wall.

4,102,458

DEVICE IN RACKS FOR SALES PACKAGES AND THE LIKE

Henry Fors, Sundbyberg, Sweden, assignor to Fors & Forss AB, Vallingby, Sweden

Filed Jan. 21, 1977, Ser. No. 760,996
Claims priority, application Sweden, Jan. 23, 1976, 7600706
Int. Cl.[2] A47F 7/03
U.S. Cl. 211—4 7 Claims

1. A rack for supporting and displaying at least one article of goods and/or sales package of the type having predetermined dimensions and having a generally flat bottom face, said rack comprising:

at least one shelf space having a depth dimensioned to substantially correspond to the depth dimension of an article to be positioned in said shelf space and having a free height which approximates the height of an article to be positioned in said shelf space;

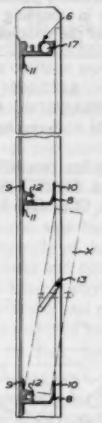
means provided at the back and opposite ends of said shelf space for preventing the rearward and sideways removal of an article positioned therein;

top means provided at the top of said shelf space for preventing the upward movement of an article positioned therein;

an immovably positioned shelf member defining the bottom of said shelf space;

an immovable projection extending upwardly from the front edge of said shelf member, the upper edge of said projection being spaced from said top means to define a vertical opening therebetween of a dimension less than the height of an article to be positioned in said shelf space;

ridge means, extending upwardly from the back edge of said shelf member, for providing the sole support for an article positioned in said shelf space by engaging such article



along the rear edge of the flat bottom face thereof and for allowing such article to tend to swing by gravity about such rear edge toward said vertical opening; and

a shiftable abutment means extending transversely of said shelf space at a position above said shelf member, said abutment means being movable between an inner first position vertically above said projection and an outer second position spaced from said shelf space, such that when an article is positioned within said shelf space with the rear edge of the flat bottom face of the article resting on said ridge means and when said abutment means is in said inner first position, the article is maintained entirely within and is prevented from being removed from said shelf space by said abutment means, and such that when said abutment means is in said outer second position, the article is allowed to swing by gravity about the rear edge so that the upper end of the article extends through the vertical opening and the article can be removed therefrom.

4,102,459

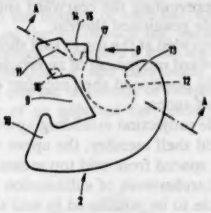
ADAPTOR DEVICE FOR COUPLING RAILWAY VEHICLES HAVING DIFFERENT TYPES OF COUPLERS

Axel Schelle, Rottach-Scherfen, and Kuno Nell, Zorneding, both of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,450
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632571
Int. Cl.[2] B61G 3/00
U.S. Cl. 213—112 5 Claims

1. An adaptor device for the coupling of Janney and Willi-

son couplers on railway vehicles comprising a body portion having two opposed sides, said sides having rigid configurations conforming respectively to the configurations of Janney



and Willison couplers in their locked positions, and means on said body portion for vertically positioning the adaptor device between such couplers in coupling position to provide for automatic engagement of the couplers.

4,102,460

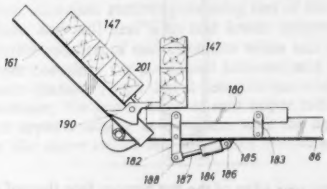
TIMBER STACKING ASSEMBLY

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Continuation-in-part of Ser. No. 747,553, Dec. 6, 1976. This application Jan. 31, 1977, Ser. No. 763,726

Int. Cl.[2] B65G *57/28*

U.S. Cl. 214—6 C **6 Claims**



1. In a timber stacking assembly having at least one elongated lifting arm and means for moving said lifting arm from a first position to a second position, the improvement in a lifting arm stop mechanism comprising:

a stacking foot element associated with said lifting arm adjacent one end thereof.

means for pivotally mounting said stacking foot element with respect to said lifting arm, and

latching means associated with said stacking foot element for locking said stacking foot element against pivoting movement when said lifting arm is in said first position and for unlocking said stacking foot element for pivoting movement when said lifting arm is in said second position, said latching means including a first counterweight connected to said stacking foot element, a second counterweight, and linkage means connected between said stacking foot element and said second counterweight.

4,102,461

EXCAVATOR WITH LOW CENTER OF GRAVITY

Ingebret Sóyland, Solhogda 2, Brynehaugen, N-4340 Bryne, Norway

Continuation-in-part of Ser. No. 597,230, Jul. 18, 1975, abandoned. This application May 23, 1977, Ser. No. 799,340

Claims priority, application Norway, Jul. 19, 1974, 742642

Int. Cl.[2] E02F *9/20*

U.S. Cl. 214—132 **8 Claims**

2. An excavator, comprising:

a lower frame, said lower frame having the configuration of a large vessel and including a bottom support plate and a generally vertical side wall, said bottom support plate being engageable with soft ground to prevent said excavator from sinking too deeply thereinto;

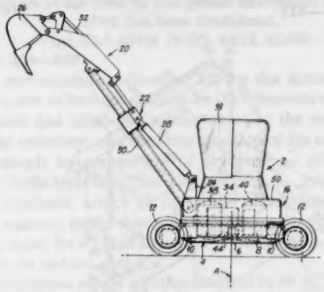
wheel means mounted fore and aft on the exterior of said lower frame;

an upper frame;

means for rotatably connecting said upper frame to said lower frame, for rotation about a vertical axis;

means connected between said upper frame and said lower frame, operable to effect relative rotation therebetween;

a boom and bucket assembly;



cabin means;

means for mounting said boom and bucket assembly and said cabin means on said upper frame, for rotation therewith;

an internal combustion engine, a hydraulic pump, and associated heavy equipment components; and

means for suspending said engine, said hydraulic pump and said associated heavy equipment components from said upper frame, whereby said items are rotatable with said upper frame and are substantially received within said vessel-like lower frame.

4,102,462

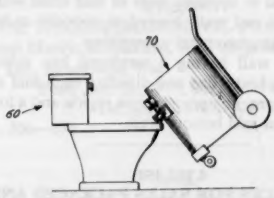
TIP DEVICE FOR A VACUUM CLEANER TANK

Rex E. Beach, El Paso, Tex., and Roland A. Blomgren, Glen Ellyn, Ill., assignors to Service Master Industries, Inc., Downers Grove, Ill.

Filed Jul. 22, 1977, Ser. No. 817,965

Int. Cl.[2] B65G *65/34*

U.S. Cl. 214—301 **1 Claim**



1. A device for supporting and stabilizing a container against a receptacle which defines an opening, so that the container may be manually tipped and the contents of the container discharged into the opening, said container having a longitudinal axis thereby defining longitudinal and transverse directions, said container including a longitudinally extending cylindrical sidewall and a transverse bottom wall, said sidewall extending longitudinally below said bottom wall, said sidewall and said bottom wall thereby defining a lip which extends below said bottom wall, said receptacle including a rim about said opening, said device comprising, in combination:

an elongated pivot member engageable against said rim to provide a transverse axis about which said container may be tipped;

spaced arms secured to said elongated angle member adjacent the ends thereof;

a brace member including a partially cylindrical curved surface, said brace member connected to the pivot member by the arms and adapted to contact said cylindrical sidewall along said curved surface;

a pair of elongated legs, each of said legs having an end attached to one of said arms and another end at which said legs are joined;

a pair of hooks joined to said legs at said joined end, said hooks engageable about said lip; and

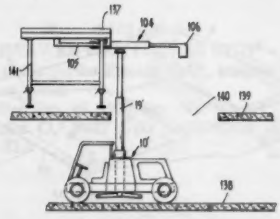
an elastic cord secured between said arms, said cord being securable to said container, whereby said cord may be attached to the container to draw said hooks against said lip and hold said brace member against said container in position for use.

4,102,463

TRANSPORTER FOR SLAB CASTING TABLES

Hans Heinrich Schmidt, 1 Linton Ave., Lower Templestowe, Victoria, Australia

Filed Dec. 14, 1976, Ser. No. 750,429
Claims priority, application Australia, Dec. 17, 1975, PC4309
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—671 **15 Claims**



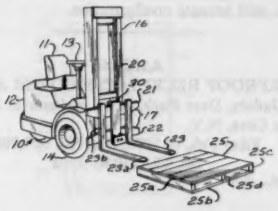
1. A mobile transporter for use in transporting equipment during the construction of a building, said transporter comprising a lower section supported on ground engaging means for movement thereon, a mast supported within said lower section for vertical movement relative to the lower section, and an upper frame supported on the upper end of said mast and adapted, in use, to supportingly engage beneath a load to be transported thereon, wherein the lower end of said mast carries a ground engaging support structure, lifting means interconnected between the support structure and said lower section for, in use, lowering and raising said mast and support structure between a position wherein said lower section is supported on said ground engaging means and a position whereby the support structure is moved to a ground engaging position for subsequently lifting said lower section and its ground engaging means off the ground whereby said lower section is supported on said support structure, and means cooperating with said mast and support structure arrangement and said lower section for achieving relative rotating movement between said lower section and said mast, wherein said mast incorporates means to raise said upper frame independently of said lifting means from a lower position spaced from the ground to a vertically higher position up to in the order of at least twice the distance that the upper frame is above the ground in the lower position, wherein said mast includes a plurality of coaxial telescoping members wherein one of said members is connected to said lower section and another of said members is attached to said upper frame.

4,102,464

PALLET SAVER DEVICE FOR FORK LIFT TRUCKS

Frank C. Schuster, Peoria, Ill., assignor to Little Giant Products, Inc., Peoria, Ill.

Filed Feb. 14, 1977, Ser. No. 768,056
Int. Cl.[2] B66F *17/00*
U.S. Cl. 214—750 **10 Claims**



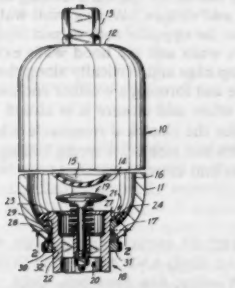
1. In an attachment for a lift truck having a pair of spaced apart forks extending therefrom for handling a pallet, each fork having a leg secured to a carriage vertically movable on said truck and a horizontally projecting tine defining a surface for carrying a load connected to said leg by a fillet, said attachment comprising: mounting means for securing said attachment to and extending from said carriage, an impact bumper carried by said mounting means, and a contact surface on said impact bumper forward of said fork legs and fillets and positioned for initial contact with said pallet free of the other elements of said attachment, said bumper and said contact surface being mounted centrally of the carriage between and out of contact with said forks and extending in line with and below the plane of said fork load carrying surface and adapted for cushioned impact centrally of said pallet before the vertical legs and fillets of said forks contact said pallet.

4,102,465

LOCKING RING FOR PRESSURE VESSEL AND METHOD OF MAKING THE SAME

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 6, 1977, Ser. No. 794,478
Int. Cl.[2] F16L *55/04*; F16J *15/02*
U.S. Cl. 220—3 **3 Claims**



1. A locking ring assembly for retaining the closure plug of a hydraulic pressure accumulator device in the oil port of said device comprising, in combination, first and second arcuate metallic segments, said segments each encompassing an arc of substantially 180°, said segments being disposed in an essentially annular configuration, said segments including on their outer periphery a circumferential, outwardly facing groove, the groove portions of said segments being aligned to define an annulus, said groove portions, in transverse section, including an outwardly directed, restricted open mouth portion and a

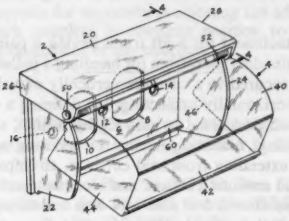
radially inwardly located recess, the transverse dimension of said recess being substantially greater than the transverse dimension of said mouth portion, whereby said groove portion defines a non-entrant configuration, the combination including a resilient, elastic, continuous annular retainer collar surrounding and molded in situ over said segments, said retainer collar including an integral annular bead portion filling said groove portions of said segments, said retainer collar maintaining said segments in said arcuate configuration.

4,102,466

WEATHERPROOF RECEPTACLE COVER AND SHIELD

Harald B. Jadatz, Deer Park, N.Y., assignor to Slater Electric Co., Glen Cove, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,708
Int. Cl.[2] H02G *3/18*
U.S. Cl. 220—3.8 **5 Claims**



1. A weatherproof cover for attachment to the open face of a vertically mounted electrical receptacle outlet box and for forming a weather enclosure therewith, said cover including a plate having at least one opening extending therethrough for receiving an electrical receptacle mounted in said box, said plate having a hood having a wall extending horizontally along the top edge and having walls extending vertically along the opposite side edges of said plate, said hood wall extending horizontally along the top edge of said plate extending outwardly and horizontally beyond the side walls of said hood, said plate having a downwardly and outwardly sloping lip extending horizontally across said plate intermediate the side walls of said hood and spaced upwardly from the bottom edge of said plate, and a closure mounted adjacent the leading edge of the hood for pivoted movement along a line spaced inwardly and below the outward leading edge of said top edge hood wall, said closure having a front wall, a bottom wall and side walls at the opposite ends of said front and bottom walls, said closure walls and the hood walls extending horizontally along the top edge and vertically along the opposite side edges of said plate and forming a weather enclosure for the electrical receptacle when said closure is in closed position and a weathershield for the electrical receptacle when said closure is in open position and means for spring biasing said closure on said pivoted axis into closed position.

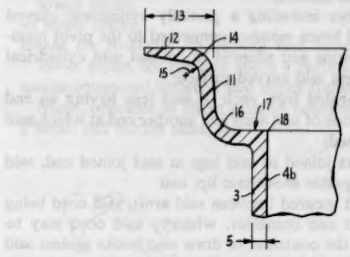
4,102,467

TAPERED PLASTIC CONTAINER WITH SEAMED METAL END AND METHOD FOR MAKING IT

Keith R. Woodley, San Francisco, Calif., assignor to Wescan, Inc., San Francisco, Calif.

Filed May 4, 1977, Ser. No. 793,732
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—67 **5 Claims**

1. A molded one-piece plastic container body including a bottom wall; an upstanding side wall with an open upper end adapted to be closed by a metal end; and upper seam forming portion carrier on said side wall and being radially outwardly offset from the next adjacent portion of said side wall; an intermediate radius having a generally flat inner end supporting surface generally perpendicular to the axis of the container body and interconnecting said side wall and said upper seam forming portion; a radially outwardly directed flange carried upon said seam forming portion and gradually tapering from a thickness substantially equal to the thickness of the upstanding side wall to a thickness generally one-half that of said upstanding side wall at its outer end, said flange being connected to said upper seam forming portion through an outer shoulder section of uniform thickness and having a radius of curvature substantially less than said wall thickness.

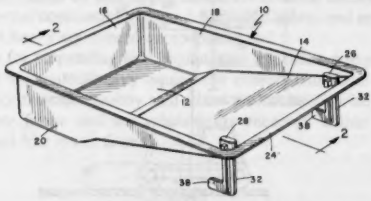


4,102,468

STACKABLE PAINT TRAY

Robert Ivan Goldman, 6658 Cibola Rd., San Diego, Calif. 92120

Filed Dec. 16, 1976, Ser. No. 751,026
Int. Cl.[2] B65D *25/24;* B05C *11/46;* A45C *5/14;* B65D *21/02*
U.S. Cl. 220—69 **6 Claims**



1. A paint tray for use in conjunction with a paint roller, said tray defined by a generally rectangular bottom having a first generally flat portion at the front thereof and a sloping portion sloping upward from the front to the back of the tray, with side walls extending upward from the bottom thereby defining a container having a deep front end and a shallow rear end, the improvement comprising:

a pair of spaced apart vertically oriented sockets in the rear underside of said tray formed in projections extending upward from said sloping bottom in said tray, said projections define roller stop means for engaging and stopping a roller short of the back wall thereof; and

a pair of independent detachable legs each having a plug for extending in tight fitting engagement into said sockets for detachably mounting said legs on said tray at the back underside thereof for supporting said tray and for removal therefrom for providing close stacking of a plurality of said trays.

4,102,469

PROTECTED MOLDED RUPTURE DISC

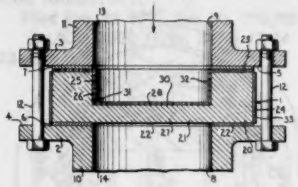
Donald M. Shegrud, and Kenneth R. Shaw, both of Kansas City, Mo., assignors to Continental Disc Corporation, Riverside, Mo.

Filed May 23, 1977, Ser. No. 799,203
Int. Cl.[2] F16K *17/14*
U.S. Cl. 220—89 A **8 Claims**

1. A pressure relief assembly for exposure to adverse process conditions comprising:

(a) a disc having a molded body with an upper face, a lower face and a rim;

(b) at least one bore extending downwardly through said upper face and into said body, said bore having a depth less than the distance between said upper face and said lower face, forming a cylinddrical bore wall and a planar bore bottom face; said bore wall and said bottom face forming a bottom circumference at the juncture thereof;



(c) said bottom face forming one face of a frangible diaphragm designed to rupture within a predicted range of pressure differential thereacross; and

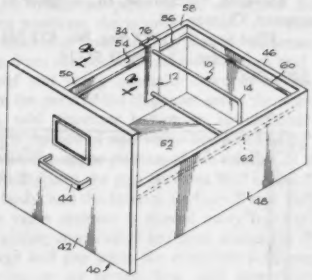
(d) an impermeable, high temperature resistant liner coextensively engaging said bottom circumference and said bottom face thereby forming a coextensive combination wherein said liner is characterized by lack of resistance to deflection of said frangible diaphragm to the point of diaphragm rupture.

4,102,470

DRAWER FILE FOLDER STOP

Jay Timmons, Palos Verdes Estates, Calif., assignor to Hiebert, Inc., Torrance, Calif.

Filed Jan. 28, 1977, Ser. No. 763,657
Int. Cl.² A47F *7/00*; A47B *88/00*
U.S. Cl. 220—22.3 **8 Claims**



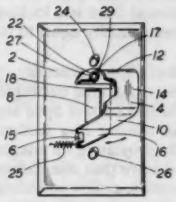
1. A drawer file folder stop comprising a plate having a relatively flat body portion having opposite sides, a top portion extending outwardly from one of the opposite sides of and generally normal to the body portion at an end of the body portion, the top portion extending outwardly from the body portion by a given distance, and a lip portion extending outwardly from the top portion in spaced-apart and generally parallel relation to the body portion, the lip portion extending outwardly from the top portion by distance substantially less than the given distance, a generally cylindrical pin mounted on the body portion at said one of the opposite sides thereof at a location substantially closer to the end of the body portion than to an opposite end of the body portion, and an elongated holder mounted on and extending outwardly from and generally normal to the other one of the opposite sides of the body portion.

4,102,471

SWITCH GUARD ASSEMBLY

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714, and Charles Di Pietro, 15 Doherty Ave., Elmont, N.Y. 11003

Filed Sep. 8, 1977, Ser. No. 831,611
Int. Cl.² H02G *3/14*
U.S. Cl. 220—242 **12 Claims**



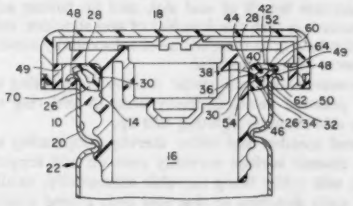
1. A switch guard assembly for preventing accidental actuation of a switch, the assembly including a switch plate and comprising a box-shaped member mounted on the switch plate and having a front wall formed with a surface disposed substantially parallel to the switch plate, said front wall being closed against access by the fingers of an operator's hand through the front wall to a switch actuator extending out of the switch plate, said box-shaped member having at least one fully open side for affording access to the switch actuator by the fingers of an operator's hand.

4,102,472

O-RINGS FOR VEHICLE FUEL TANK FILLER NECK CAPS

Paul H. Sloan, Jr., Sturgis, Mich., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 706,051, Jul. 16, 1976. This application May 24, 1977, Ser. No. 798,981
Int. Cl.² B65D *39/08, 45/02*
U.S. Cl. 220—295 **16 Claims**



12. In combination, a gas cap, a filler neck, and an annular ring providing a seal between said cap and said neck, said ring having peripherally and radially outwardly extending axially inner and axially outer lips of a connecting web disposed about said cap, said axially outer lip being formed to have a peripherally and inwardly extending bead at its radially outer edge and said inner lip being formed to provide a peripherally and outwardly extending bead at its radially outer edge.

4,102,473

QUICK COUPLING/LOCKING DEVICE

Walter E. Draxler, Arlington Heights, Ill., assignor to Arrow Pneumatic, Inc., Forest Park, Ill.

Filed Oct. 5, 1977, Ser. No. 839,337
Int. Cl.² B65D *45/32*
U.S. Cl. 220—319 **5 Claims**

1. An improved interlocking assembly for a device such as an air filter, an air lubricator, filter-regulator piggyback or the like, comprising:

a head member including a generally cylindrical outer wall, more than one uniformly radially outwardly projecting arcuate ledge formations integrally formed on said outer wall and more than one arcuate slots defined on said outer wall between said ledge formations, said ledge formation including an axially extending locking tab adjacent said slot and defining a transversely extending arcuate support surface adjacent said locking tab, said support surface being axially recessed from said locking tab and having an arcuate length substantially equal to the arcuate length of said slot;

a pressure vessel including a generally cylindrical open end section and a circumferential outwardly projecting shoulder integrally formed on said open section;

a collar having an annular ring section, a circumferential radially inwardly projecting lip integrally formed on said ring section, and more than one circumferentially spaced, outwardly projecting, axially extending lug members, said lug member having an inwardly projecting end defining a transversely extending arcuate contact surface, said lug

member having an arcuate length substantially equal to the arcuate length of said slot, said lip having an inner diameter less than the diameter of said shoulder, said ring portion having an inner diameter substantially equal to the diameter of said shoulder;

said pressure vessel and collar thereby cooperating so that said pressure vessel normally nests in said ring section with said shoulder abutting said lip,

said head member and collar thereby cooperating so that said contact surface normally rests on said support surface, said collar being movable sequentially, axially in a first axial direction so that said ends extend axially past said locking tabs, rotatably so that said ends are in registry with said slots and axially in a direction opposite said first axial direction until said head member and collar separate,

said locking tabs thus preventing said collar from being rotated unless said collar is moved in said first axial direction, whereby said pressure vessel is normally held against said head member by said collar, is readily removable and is prevented from being accidentally removed.

4,102,474

CLOSURE MEMBER

Douglas John Platts, Worksop, England, assignor to General Descaling Company Limited, England

Filed May 27, 1975, Ser. No. 580,983

Claims priority, application United Kingdom, May 28, 1974, 23537/74

Int. Cl.² B65D *45/28*

U.S. Cl. 220—323 **19 Claims**

1. The combination of a closure member and a pressure member including a body having an aperture to be closed, said closure member comprising a door fitting in said aperture, a plurality of blocks slidably mounted adjacent the periphery of said door for movement from a withdrawn position at least substantially wholly within the periphery of said door to a position in which a part of each block protrudes beyond the periphery of said door for engagement with said body, said parts of said blocks together forming a protrusion extending substantially around the periphery of said door, and means for moving the blocks from the withdrawn position to the protrud-

ing position, and said aperture in part defining an annular groove receiving said parts of said blocks; and an annular seal having separately defined surfaces sealing to said door and to said body, said seal being sufficiently flexible to be moved out of contact with the door when acted upon by a force originating outside of said pressure member, and thrust bars being arranged to transmit force applied from outside of said pressure member to said seal.

4,102,475

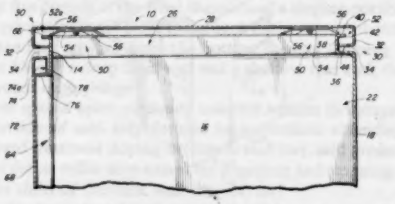
TAMPER-RESISTANT ENCLOSURE FOR ELECTRICAL EQUIPMENT

Arvydas J. Kalvaitis, Northbrook, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,244

Int. Cl.² B65D *51/16*

U.S. Cl. 220—366 **11 Claims**



1. An improved equipment enclosure of the type including a housing having an opening defined by generally planar walls, the opening being closed by a generally planar cover co-extensive with the opening; wherein the improvement comprises:

(a) a flange formed on at least a portion of the periphery of the cover;

(b) an inwardly directed lip formed on the periphery of the free edge of the flange;

(c) an inwardly directed first shelf formed on at least a portion of the free edge of one or more selected walls;

(d) a rim formed on the inner edge of the shelf;

(e) an outwardly directed first ledge formed on the free edge of the rim; and

(f) means for mounting the cover to the housing so that

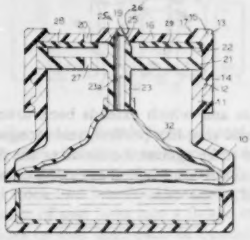
(i) the outer edge of the ledge is offset inwardly from the inner edge of the lip,

(ii) the lip is positioned between the ledge and the shelf, and
(iii) the ledge is positioned between the lip and the cover.

4,102,476
SQUEEZE BOTTLE DISPENSER WITH AIR CHECK VALVE ON COVER

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,759
Int. Cl.[2] B05B *11/04;* B65D *47/34*
U.S. Cl. 222—209 7 Claims



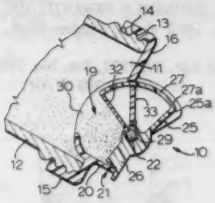
1. A squeeze bottle type dispenser, comprising a resiliently collapsible container for the liquid to be dispensed, a cover means on said container, said cover means having a flexible resilient central portion flexible outwardly of the cover means away from the container under gas pressure generated in said container when said container is squeezed, a dispensing valve member on said cover having a dispensing orifice therein and an interior surface facing into said container, a dispensing valve body fixed in position within said container adjacent said cover and having an exterior surface complementary in shape to that of the interior surface of said dispensing valve member and with which the interior surface of said valve member tightly engages when the parts of the dispenser are in the non-dispensing positions, the interior of said valve body being hollow and said valve body having product dispensing apertures opening from said hollow interior through said exterior surface thereof and being normally covered by said valve member when the parts of the dispenser are in the non-dispensing positions, said dispenser having an air chamber therein surrounding the outside of said valve body and being in communication with the upper portion of the interior of said container and opening into the gap between said exterior surface of said valve body, and the interior surface of said valve member when the valve member is moved away from said valve body for permitting compressed gas from within the container to flow through said gap when the container is squeezed, said dispenser having an air return flow path therethrough and valve means in said air return flow path opening said air return flow path when the pressure on the outside of the container is greater than the pressure on the inside of the container, and liquid delivery means within said container and connected to said valve body for delivering liquid to said hollow interior of said valve body when the container is collapsed.

4,102,477
SUGAR DISPENSING APPARATUS

Jong Un Yoon, 83 Elmvalz Ave., Brampton, Ontario, Canada

Filed Aug. 30, 1976, Ser. No. 718,541
Int. Cl.[2] G01F *11/28*
U.S. Cl. 222—438 3 Claims

1. A device for use with a container for dispensing measured quantities of free-flowing particulate substance from a container comprising a chamber having an inlet and an outlet, two spaced-apart side walls, a front wall and a back wall; the top edges of said walls defining said outlet and the bottom edges of said walls defining said inlet; said front wall at the outlet forming a spout for said device; a cover for said outlet and a moveable arcuate shutter for said inlet; a lever arm being integral with said cover and said arcuate shutter; the juncture of said cover and said lever arm being pivotally connected to a pin disposed between and journalled through said side walls adjacent said outlet whereby said lever arm, said cover and said arcuate shutter pivot about a common axis; said cover and said

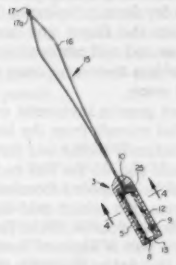


arcuate shutter being spring biased in the outlet closed and inlet open position, said lever arm being depressible against the spring bias such that said lever arm pivots about the longitudinal axis of said pin to move said cover away from said outlet of said chamber and to move said arcuate shutter over said inlet of said chamber to permit a free-flowing particulate substance to flow out of said chamber.

4,102,478
NEEDLE THREADER

Constantin Samoilov, 237 N. Front St., Woodburn, Oreg. 97071

Filed Dec. 27, 1976, Ser. No. 754,832
Int. Cl.[2] D05B *87/02*
U.S. Cl. 223—99 6 Claims



1. In a needle threader:
a handle portion comprising:
a first support member comprising an outer support member of tubular shape,
a second support member for cooperative interengagement with said first support member, said members having mutually interengaging surfaces, said second support member comprising an inner support member snugly disposed within said outer support member,
a wire threading loop having at one end two terminal wire ends and at the opposite end, medially of said wire ends, a thread-engaging tip portion, said wire ends being tightly sandwiched between said interengaging surfaces of said inner and outer support members so as to be held rigidly in place thereby,
said outer support member including a hollow axial bore for slidably receiving said inner support member and extending from an open end of said outer support member to a closed end thereof,
means defining a wire passage extending axially through said closed end and opening into said bore for receiving a portion of said wire threading loop,

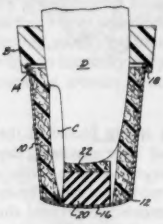
and a raised collar portion extending inwardly of said bore from said closed end, said collar portion surrounding the opening of said wire passage into said bore and being spaced from the sidewalls of said bore so as to fit snugly within a portion of said inner support member.

4,102,479

THIMBLE STRUCTURE

Gertrude Braley, 5602 Palos Verdes Blvd., Torrance, Calif. 90505

Filed Apr. 28, 1977, Ser. No. 791,779
Int. Cl.[2] D05B *91/04*
U.S. Cl. 223—101 **1 Claim**



1. In combination with a thimble that includes a frusto-conical shell that has a plurality of spaced transverse perforations therein, said shell having first and second ends; an end piece that closes said first end; an outwardly projecting circular bead on said second end, an assembly that permits said thimble to be worn on a finger that has a projecting finger nail of substantial length, said assembly including:

a. a resilient porous liner secured to the interior surface of said shell to frictionally grip a finger inserted therein, and keep the finger dry from perspiration by allowing air to circulate between the finger and ambient atmosphere through said liner and said perforations;

b. a resilient pad of less transverse cross sectional area than that of said end piece;

c. a pedestal of not greater transverse cross sectional area than said pad that extends from the inner surface of said end piece longitudinally within said shell, with said pedestal supporting said pad on the free end thereof, and said pad and pedestal being spaced from said lines to define a ring-shaped recess into which said fingernail of a user extends when the tip portion of the finger of which said fingernail forms a part is disposed in said thimble; and

d. a circular band that has an interiorly disposed recess that engages said bead to support said band from said shell and in longitudinal alignment therewith, said band having an interior frusto-conical surface that is a continuation of said frusto-conical surface in said shell, and said band of substantially the same depth as the height of said pedestal to permit substantially the same length of said tip portion of said finger to be inserted within the interior of said shell and band as would be possible to insert in said shell if said tip portion had no projecting fingernail and said pedestal and pad were not present in said shell.

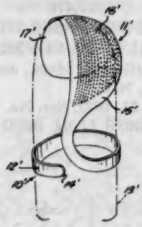
4,102,480

THIMBLES

Bawn O'Beirne-Ranelagh, 31 Clanricarde Gardens, London W2, England

Filed Sep. 20, 1976, Ser. No. 725,113
Claims priority, application United Kingdom, Sep. 24, 1975, 39137/75
Int. Cl.[2] A41H *31/00*
U.S. Cl. 223—101 **7 Claims**

1. A finger guard comprising a first ring-like portion capable of gripping the finger on which the guard is to be placed adjacent the end of the finger, and an elongated protective portion joined to said ring-like portion along an arcuate section thereof of substantially less than 90° and extending transversely away from the plane of said ring-like portion in a helix-like path and terminating in a terminal portion remote from said



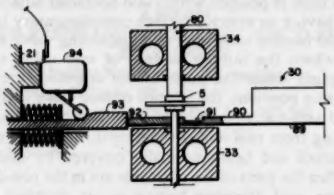
ring-like portion and which extends back toward but terminates short of said ring-like portion, said elongated protective portion adapted to lie against the inside of the finger of a user and said terminal portion adapted to extend over at least a part of the fingernail of the user.

4,102,481

SEALING PRESS FOR AUTOMATED ASSEMBLY APPARATUS

Ernest C. Ollenbach, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 575,771, May 8, 1975, abandoned. This application Nov. 19, 1976, Ser. No. 743,381
Int. Cl.[2] H01L *21/52*
U.S. Cl. 228—6 R **5 Claims**



1. A press for sealing upper and lower ceramic members to a metal member, comprising:

(1) upper and lower die block members, each configured to receive the upper and lower ceramic members, respectively;

(2) means for automatic loading of said upper and lower ceramic members into said upper and lower die block members;

(3) means for aligning said upper and said lower ceramic members;

(4) means for aligning said metal member between said aligned ceramic members;

(5) means for applying heat to each of said upper and lower ceramic members by means of said upper and lower die block members;

(6) means for applying pressure to said upper and lower ceramic members by means of said upper and lower die block members;

(7) means for separating said upper and lower ceramic members from said upper and lower die block members;

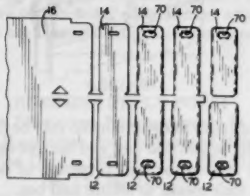
(8) means for holding said upper and lower ceramic members in an intermediate position between said upper and lower die block members when said upper and lower die block members are separated.

4,102,482

PROCESS FOR PRODUCING FUSIBLE LINKS

Donald Ray Ruegsegger, 425 W. Maple, Waterloo, Ind. 46793

Division of Ser. No. 554,650, Mar. 3, 1975, Pat. No. 4,055,829.
This application Jan. 21, 1977, Ser. No. 761,435
Int. Cl.² A62C 37/30
U.S. Cl. 228—170 5 Claims



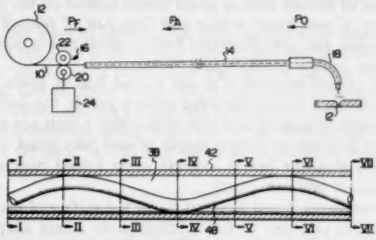
1. A process for making fusible links adapted to be temperature responsive for effecting operation of alarms or other devices, comprising the steps of progressively forming from flat sheet metal stock two interfittable rectangular links, bending the outer edge of said links into a flange extending along three of the sides of said link, each of opposite sides of the respective link flanges including complementary inclined camming side which effect lateral spreading movement of the confronting surfaces of said links when they are drawn in opposite directions, "terne" coating the outer surfaces of said link and then flux coating and thereafter soldering the links together with a eutectic solder.

4,102,483

METHOD FOR FEEDING A WELDING WIRE

Fumio Ueyama, Ikoma, and Tadashi Hattori, Takarazuka, both of Japan, assignors to Osaka Denki Co., Ltd., Osaka, Japan

Filed Mar. 11, 1976, Ser. No. 665,678
Claims priority, application Japan, Mar. 13, 1975, 50-30963; Mar. 13, 1975, 50-30964; Mar. 13, 1975, 50-30965
Int. Cl.² B23K 9/12
U.S. Cl. 228—244 4 Claims



1. A method for feeding a welding wire comprising:

feeding a substantially straight welding wire having a substantially circular cross-section to an elongated conduit cable having a wire guide bore with an elongated cross-section, said conduit cable having a wire exit end coupled to a welding torch, and

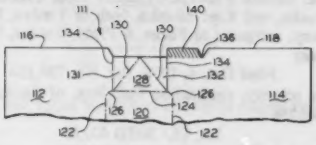
continuously imparting a feeding force to the straight welding wire at the wire entry side of the conduit cable to cause the straight welding wire to deform in said elongated cross-section of said bore into the form of a sine curve in one plane and in the axial direction of said bore due to the co-relation of said feeding force on said wire and a force applied at the tip end of said wire by said welding torch at said exit end.

4,102,484

LEAKAGE RESISTANCE CARTON

Michael A. Kipp, Phoenixville, and Richard T. Walter, Norristown, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed May 4, 1977, Ser. No. 793,777
Int. Cl.² B65D 5/24, 3/00
U.S. Cl. 229—16 A 3 Claims



1. A tubular carton formed from a cut and scored blank of paperboard, or the like, said carton comprising:

(a) a side wall formed from a pair of generally rectangular side wall panels having their edges secured in an overlapped relationship;

(b) a bottom wall foldably secured at opposite side edges to bottom edges of said side wall panels along fold lines;

(c) a first gusset panel foldably secured to said bottom wall along a longitudinal fold line substantially normal to said fold lines between said bottom wall and said side wall panels;

(d) a pair of second gusset panels each foldably secured along diverging fold lines to said first gusset panels and to a respective one of said side wall panels;

(e) a recess formed along an edge of at least one of said side wall panels and interposed between a gusset panel and an edge of the other one of said pair of said side wall penels when said carton is in erected condition;

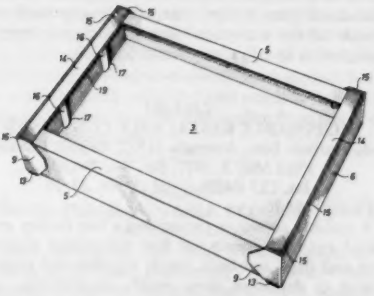
(f) a spot of adhesive applied in the area of a point common to said first gusset panel and each of said pair of said second gusset panels.

4,102,485

TRANSPORT BOX

Sven Johnsson, Huskvarna, Sweden, assignor to Pacfex Aktiebolag, Kinna, Sweden

Continuation of Ser. No. 682,670, May 3, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,686
Int. Cl.² B65D 11/20, 61/00
U.S. Cl. 229—23 R 11 Claims



1. A box comprising a casing made of a sheet which is folded to form a bottom and two side walls, each with inwardly-extending flanges on their top edges; and two end elements adapted to receive the opposite ends of the folded casing and to

fix them relative to the end elements, each said end element comprising side portions adapted to lie along the side walls of the casing and to positively engage therewith; guide bars with guiding edges which slope towards the bottom edges of the insides of the end elements to guide the opposite end of the casing towards said bottom edges during assembly; a bottom flange at said bottom edge to support the bottom of the casing; and an inwardly directed projection on each side portion of each end element engaging in a hole in each respective side wall for positive engagement therewith.

4,102,486

PACK, MORE PARTICULARLY FOR CIGARETTES

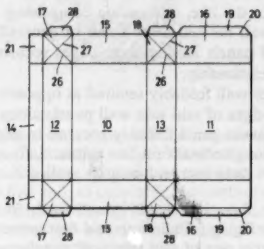
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,116

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2445256

Int. Cl.² B65D *85/10*

U.S. Cl. 229—37 R **2 Claims**



1. A foldable blank for forming a rectangular cigarette pack, comprising:

(a) sequentially connected first side (12), front (10), second side (13) and rear (11) rectangular walls,

(b) sequentially connected first (17), second (15), third (18) and fourth (16) rectangular end flaps adjoining the lateral edges of the first side, front, second side and rear walls, respectively,

(c) first (28), second (28) and third (19) closure strips adjoining the lateral edges of the first, third and fourth end flaps, respectively, and

(d) a pair of intersecting diagonal fold lines on each of the first and third end flaps,

(e) the blank being adapted to first be formed into a tube whereafter the fourth end flap is folded down over the contents of the pack, which simultaneously causes the first and third end flaps to fold about one of their diagonal fold lines in a triangular manner and brings the first, second and third closure strips into planar engagement with the inside of the second end flap, said closure strips being adapted to be adhesively secured thereto.

4,102,487

DISPOSABLE RESEALABLE CONTAINER

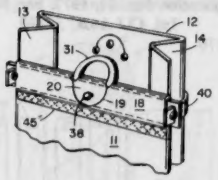
Ricardo Hurtado Soto, Apartado 91711, Bogota, Colombia

Filed May 5, 1977, Ser. No. 794,005

Int. Cl.² B65D *33/02, 33/06, 33/16*

U.S. Cl. 229—54 R **7 Claims**

1. A sealable container comprising a bag having generally flat front and back panels and first and second pleated sides joining said front and back panels together and cooperating therewith to define an open mouth; an elongated stiffener member attached to said front panel and spaced from said mouth beneath a foldable upper portion of said bag and defining first and second extensions extending laterally beyond said front panel, each extension defining a slot; a flexible band extending about said back panel and said pleated sides and having its ends extending through said slots of said band extensions; and lock means for securing said band to said stiffener member; whereby said pleats may be folded to close the mouth



of said bag, said upper foldable portion may be folded over said stiffener member to seal said bag, and the free ends of said band may be drawn around the folded portion of said bag and attached to said lock means to secure said bag.

4,102,488

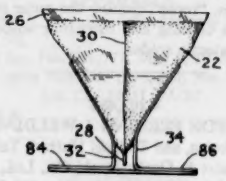
DISPOSABLE CONTAINER

Darrell R. Morrow, 7 Pamela Ct., Old Bridge, N.J. 08857, and Michael Schuler, 40 Midwood Ave., Edison, N.J. 08817

Division of Ser. No. 493,178, Jul. 30, 1974, Pat. No. 3,950,918. This application Mar. 15, 1976, Ser. No. 666,790

Int. Cl.² B65D *33/02*

U.S. Cl. 229—55 **12 Claims**



1. A foldable blank for forming the base of a container, said blank having a top and bottom surface, and lengthwise and crosswise dimensions, comprising:

a pair of first folding guide means spaced on the periphery of said blank, each of said first folding guide means coacting with the end of the blank adjacent thereto to define arm panel means;

a pair of second folding guide means spaced on the periphery of said blank within said first pair of folding guide means, said pair of second folding guide means defining a base surface panel on said blank;

each of said adjacent first and second folding guide means defining a pair of shoulder surface panels, the peripheral length of each of said pair of shoulder panels not exceeding half the peripheral length of said base panel, each of said shoulder panels adapted to be folded over and lie against said base panel;

first adhesive means disposed on the top surface of said blank within said pair of first folding guide means adapted to adhere each of said pair of shoulder panel means to the adjacent area of said base panel means when said blank is folded along each of said second folding guide means;

second adhesive means disposed on said top surface of said blank on each of said arm panel means;

removable protective means covering said adhesive comprising: a continuous layer extending over both arms of said blank;

separating means on said layer disposed proximate said pair of first folding guide means for separating said continuous layer into three separate segments, one for each of said arm panel means and the remaining segment covering the adhesive means disposed on the remainder of said top surface; removable protective means are removed, from

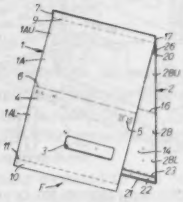
said remaining segment and said blank is then folded along said first and second pair of folding guide means in a sequence whereby it is folded along each of said first pair of second folding guide means before being folded along the adjacent first folding guide means, said adhesive means will coact with said base and shoulder panel means to adhere said shoulder panel means to said base panel means, and, said second adhesive means will enable each of said pair of arm panel means to adhere to an item disposed above said shoulder panel means, when said protective means are removed from said arm panel means.

4,102,489

BUSINESS REPLY FORM

Roland T. Lucas, Milwaukee, Wis., assignor to St. Luke's Hospital Research Foundation, Inc., Milwaukee, Wis.

Filed Dec. 1, 1977, Ser. No. 856,214
Int. Cl.[2] B65D *27/06*
U.S. Cl. 229—73 **14 Claims**



1. A business reply form for use between a sender and a recipient comprising:
- a first sheet foldable in one direction;
- a second sheet foldable in said one direction and shorter than said first sheet;
- each sheet having outer and inner sides and top and bottom edges and said sheets being secured together along their top edges;
- first tear lines spaced from the top and bottom edges of each sheet and defining first tear strips;
- a second tear line spaced from said first tear line at the top edge of said second sheet defining a second tear strip;
- a first layer of adhesive for securing the outer side of the first tear strip at the top edge of said second sheet with the inner side of the first tear strip at the bottom edge of said first sheet when both sheets are folded in said one direction;
- a second layer of adhesive for securing the inner side of the first tear strip at the bottom edge of said second sheet with the inner side of the second tear strip at the top edge of said second sheet when said second sheet is folded in a direction opposite to said one direction;
- an address space on the inner side of said second sheet;
- and a window in said first sheet in registration with said address space.

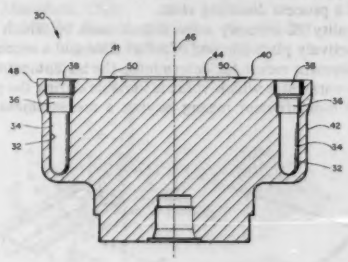
4,102,490

DATA RING FOR VERTICAL TUBE ROTOR

Steven John Chulay, Los Altos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 6, 1977, Ser. No. 803,818
Int. Cl.[2] B04B *5/04*
U.S. Cl. 233—26 **6 Claims**

1. A centrifuge rotor comprising:
- a rotor body;
- a plurality of tube apertures symmetrically arrayed in a circular pattern within said rotor body; and
- means integrally formed with and positioned above the upper surface of said rotor for identifying each of said apertures, said identifying means and said rotor body being formed from one integral member, said upper surface being coincident with a high stress field in said rotor during centrifugation, said identifying means being outside of said high stress field to eliminate potential weak



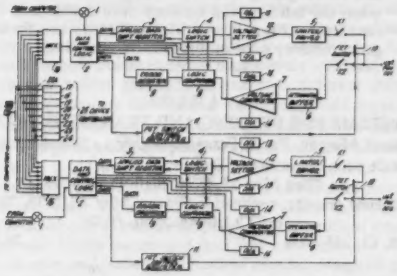
areas in said upper surface of said rotor during centrifugation.

4,102,491

VARIABLE FUNCTION DIGITAL WORD GENERATING, RECEIVING AND MONITORING DEVICE

Louis DeVito, West Milford, and Albert H. Easer, Clifton, both of N.J., assignors to Instrumentation Engineering, Inc., Franklin Lakes, N.J.

Filed Dec. 23, 1975, Ser. No. 643,746
Int. Cl.[2] G01R *31/00*; G06F *11/00*
U.S. Cl. 235—302 **6 Claims**



1. Improved digital word generating and receiving apparatus for generating and applying serially to plural terminals of a unit under test plural stimulus multibit digital words and for receiving for analysis from the terminals of the unit under test plural response signals, having a unique applied data shift register for applying said multibit digital words to each of said terminals and a unique means for receiving said response signals therefrom, wherein the improvement comprises means for controlling the application from said plural applied data shift registers of said plural multibit digital words to said plural unit under test terminals so that each of said plural applied data shift registers is able to apply multibit digital words to its associated unit under test terminal at a rate independent from that of other applied data shift registers.

4,102,492

UNIVERSAL PROGRAMMABLE PROCESS CONTROL APPARATUS

Joseph Gold, Springfield, and Frank Farese, Linden, both of N.J., assignors to Valcor Engineering Corp., Kenilworth, N.J.

Continuation of Ser. No. 700,300, Jun. 28, 1976, abandoned.
This application Jul. 28, 1977, Ser. No. 819,875
Int. Cl.[2] G06K *15/00*; H01H *43/08*; G06F *7/38*; G05B *5/00*
U.S. Cl. 235—375 **22 Claims**

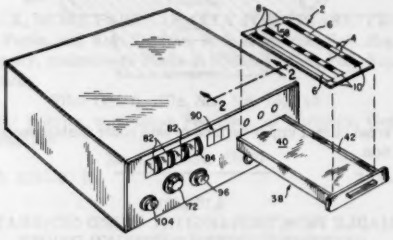
1. Apparatus for selectively enabling and disabling a process depending on the instantaneous magnitude of a measurement

made during the process in accordance with a prescribed program comprising:

a control switch actuable between a process enabling state and a process disabling state,

a plurality of memory core means each of which can be selectively placed in one of a first state and a second state,

measurement means for determining the instantaneous value of a parameter which value is variable during the process, said measurement meang having a measurement output



signal with a characteristic having a magnitude indicative of the instantaneous magnitude of said measurement, and means responsive to said measurement output signal for sequentially interrogating the memory core means in order to determine the state of the interrogated memory core means, said control switch means being responsive to said interrogating means for being in said enabling state when the interrogated memory core means is in its first state and for being in said disabling state when the interrogated memory core means is in its second state.

4,102,493

SYSTEMS FOR STORING AND TRANSFERRING DATA

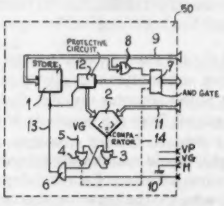
Roland Moreno, Paris, France, assignor to Societe Internationale pour l'Innovation, France

Filed May 13, 1976, Ser. No. 686,011

Claims priority, application France, May 13, 1975, 75 14807

Int. Cl.[2] G06K *5/00, 19/06*

U.S. Cl. 235—419 **24 Claims**



1. A system for storing and transferring data in confidential manner, the system comprising: at least one independent electronic portable article, and at least one independent transfer device, the portable article comprising: at least one store for storing data in an easily transportable form containing enabling data, coupling means accessible from the exterior of the portable article and used for temporarily coupling the portable article to the transfer device, and store control circuits connected between the coupling means and the store, an identification circuit entirely contained in the portable article and connected to the store and the coupling means, the identification circuit comparing the enabling data in the store with a confidential item introduced into the transfer device by the possessor of the portable article; the store and the control circuits being constructed in the form of logic microstructures; the transfer device comprising: means actuated by the person in possession of the portable store, so as to insert a confidential item into the transfer device, and means for transferring data to the portable article.

4,102,494

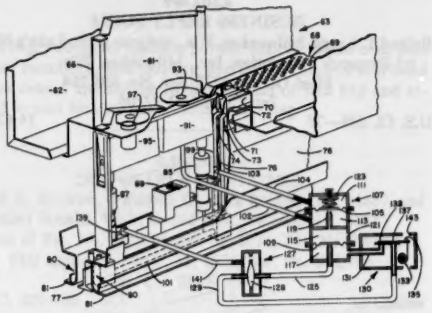
AIR DISTRIBUTION SYSTEM

Milton H. Coleman, East Syracuse, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,387

Int. Cl.[2] F24F *11/02*

U.S. Cl. 236—1 B **5 Claims**



1. In an air conditioning system for conditioning the air in a plurality of enclosed areas in a building, each of the enclosed areas having a peripheral portion requiring conditioned air having a variable temperature, and an interior portion requiring conditioned air at a constant temperature, terminal means disposed in each of the enclosed areas for the supply of conditioned air thereinto; first air conditioning apparatus to provide conditioned air at a temperature level which may be varied; means to supply said varying temperature conditioned air to a first portion of said terminal means; second air conditioning apparatus to provide conditioned air at a relatively constant temperature level; means to supply said relatively constant temperature air to a second portion of said terminal means; said terminal means including first control means to regulate the quantity of said constant temperature air discharged into said area in accordance with the temperature in said interior portion of said area, including means to generate a variable magnitude control signal indicative of the quantity of constant temperature air discharged into said area; and second control means responsive to a second control signal to regulate the quantity of said variable temperature air discharged into said area, the improvement comprising:

temperature responsive means to sense the temperature of said variable temperature conditioned air and to selectively direct said second control signal through first and second flow paths in response to said sensed temperature;

valve means interposed in said second flow path and responsive to the magnitude of said first control signal to transmit said second control signal when the magnitude of said first signal increases above a predetermined level and to terminate the transmission of said second control signal when the magnitude of said first signal decreases below said predetermined level; and

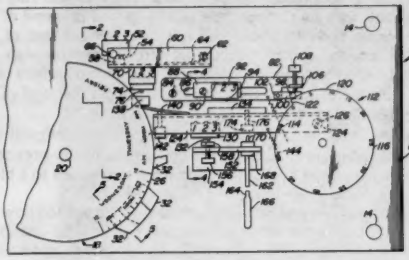
thermostatic means interposed in said first and second flow paths to vary the magnitude of said second control signal including means responsive to the temperature of the air in the space being conditioned to regulate the flow of said second control signal through said first and second flow paths in accordance with the sensed air temperature to vary the magnitude of said second control signal to vary the volume of said variable temperature air stream discharged into said space irrespective of the temperature of said air stream.

4,102,495

HEAT CONTROL DEVICE

M. Rutledge Flynn, and Raymond P. Schultz, both of Wilkes-Barre, Pa., assignors to Control Devices, Inc., Wilkes-Barre, Pa.

Filed Jan. 21, 1977, Ser. No. 761,487
Int. Cl.[2] F23N 5/20
U.S. Cl. 236—46 R 4 Claims



1. A heating control system for selectively energizing a heating unit at predetermined intervals during a multiday cycle in response to temperature comprising:

a base, three switches, two arms pivotally mounted on said base and two programmers;

said first switch being mounted to said base and including two contacts and a switch operator which is normally in contact with one of said contacts,

said first arm including means for engaging said first switch operator to close the other of said contacts, and means for urging said arm about said pivot in a direction away from said first switch,

said first programmer being mounted on said base for timed cyclical movement to correspond to said multiday cycle, said programmer being disposed on the opposite side of said first arm from said first switch and including a plurality of raised camming surfaces that correspond to intervals when the circuit to the heating unit is to be enabled, said raised surfaces being engagable with said first arm to move it toward and away from said first switch to selectively cause said operator to contact one or the other of said contacts,

said second switch being mounted on said first arm for movement therewith and including two contacts and a switch operator which is normally in contact with one of said contacts,

means for electrically interconnecting said first and second switches,

said second programmer being mounted for timed cyclical movement for a period which is substantially less than one day, said second programmer including a linearly increasing camming surface,

means for urging said second arm about its pivot in a direction opposite to the direction in which said first arm is urged and so that it bears against said linearly increasing camming surface,

said third switch being mounted on said second arm for movement therewith and including two contacts and a switch operator which is normally in contact with one of said contacts when said second arm lies along the low portion of said linearly increasing camming surface and which is in contact with the other one of said contacts when said second arm lies along the high portion of said camming surface to complete a circuit through said first and second switches to energize the heating unit, and

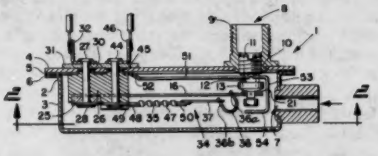
temperature responsive means that is operative to displace said operator in said second switch to said other contact in said second switch when a predetermined high temperature is reached to open the circuit to the heating unit.

4,102,496

THERMAL VALVE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Jan. 29, 1976, Ser. No. 653,477
Int. Cl.[2] F16K 31/56, 31/04
U.S. Cl. 236—48 R 8 Claims



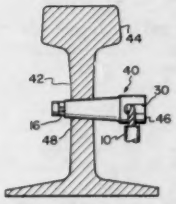
1. A fluid valve, comprising a fluid-tight enclosure having an inlet and an outlet, a valve element supported for movement to respective positions to open and to close said outlet, and actuator means for moving said valve element from one of said positions to the other of said positions, said actuator means including a thermally responsive means for producing a mechanical displacement output, movable over-center mechanical energy storage means operatively connected to said valve element for moving said valve element from one to the other of said positions in response to such mechanical displacement output of said thermally responsive means, holder means for supporting said valve element, said energy storage means comprising a resilient member supported between said thermally responsive means and said holder means, said thermally responsive means including an arm movable relative to said holder means in response to a change in temperature of said thermally responsive means, said resilient member having first and second support points movable respectively with said arm and with said holder and thus having two different stable positions depending on the relative locations of said support points, and said resilient member tending in each of said stable positions to urge said support points and thus said arm and said holder means away from each other, whereby in one of said stable positions said resilient member urges said holder means and thus said valve element to a position to close said outlet and in the other one of said stable positions said resilient member urges said holder means and thus said valve element to a position to open said outlet, said resilient member comprising a C-spring, said C-spring having opposed arms, and coupling means at one end of said thermally responsive means for connecting one arm of said C-spring to said thermally responsive means, said coupling means including an electrical insulator having a notch, and said one arm of said C-spring including a bent portion facing said notch and being retained therein under the urging of pre-loaded mechanical energy in said C-spring.

4,102,497

RAIL BOND

Ralph T. Lowerre, Coral Springs, Fla., assignor to Hanlon & Wilson Company, Jeannette, Pa.

Filed Aug. 4, 1976, Ser. No. 711,430
Int. Cl.[2] B60M 5/00
U.S. Cl. 238—14.8 9 Claims



1. A rail bond terminal comprising:

A. a flexible stranded conductor;

B. an inner sleeve secured to said conductor adjacent one end thereof, the outer surface of said inner sleeve being substantially cylindrical and having an elongated barrel portion and a radially extending flared portion formed thereon adjacent one end;

C. an outer sleeve including a head portion and a shank portion having a tapered outer surface, a cylindrical bore extending through said shank portion and through said head portion such that the outer sleeve is open at both ends, the diameter of the bore being slightly less than the radial extent of said flared portion such that when the inner sleeve and conductor are inserted into the bore, the flared portion frictionally engages the wall of the bore;

D. the end of the elongated barrel portion of said inner sleeve opposite the end adjacent to said flared portion being inserted into said cylindrical bore in said shank portion of said outer sleeve at the smaller end of said shank portion; and

E. a radial opening formed in said head portion of a size sufficient to receive said conductor.

4,102,498

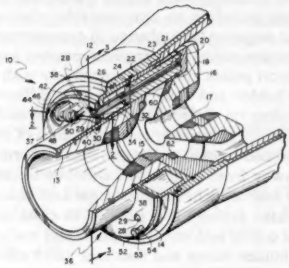
RING LOCK ACTUATION SYSTEM

Charles C. Cherry, McGregor, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 7, 1975, Ser. No. 566,018

Int. Cl.² B63H *11/10*

U.S. Cl. 239—265.19 **6 Claims**



1. A mechanical ring lock actuation device for actuation of a secondary nozzle body commonly associated with a dual area solid rocket nozzle configuration into a blocking position during rocket engine operation comprising:

a main nozzle body, said body forming a main throat section thereby, said nozzle body terminating at a first end portion perpendicular to an axis of said nozzle body,

a movable centerbody spaced from, concentrically positioned within and axially aligned with said main nozzle body, said centerbody forming a secondary nozzle thereby,

at least one elongated support piston rod axially aligned with and connected at one end to the downstream side of said centerbody and at its opposite end, said piston rod is interfitted with at least one cylinder formed by said main nozzle body,

at last one piston rod spike connected to said opposite end of said support piston rod, said spiked rod being axially aligned and centrally positioned within said at least one cylinder, the downstream conically shaped spiked end of said piston rod spike extending through at least one orifice formed by said first end portion of said main nozzle body, said orifice being slightly larger in diameter than the diameter of said spiked piston rod, said spiked rod being slidable within said orifice,

a ring lock plate having a first side positioned adjacent said first end of said main nozzle body and rotatable thereon, said ring lock plate defining at least one chamferred orifice, the smaller opening of said chamferred orifice is defined by a second downstream side of said plate, said smaller opening being the same size as said orifice in said first end of said main nozzle body, the larger opening being defined by said first side of said ring lock plate facing said end of said main nozzle body, the angle of said chamferred orifice parallels the angle of said conically shaped end of said piston rod spike, said ring lock plate is rotated to align a portion of said orifice in said ring lock plate with said at least one orifice in said first end of said nozzle body to allow said conically shaped end of said piston rod spike to protrude into but not through said chamferred orifice, a portion of the conical surface of the spiked end contacting a portion of the parallel wall of said chamferred orifice in said ring lock plate,

means to retain said ring lock plate in said misaligned position to prevent rotation thereby mechanically preventing translation of said centerbody from movement to a blocking position, and

actuation means to release said retaining means to allow said ring lock plate to rotate aligning said at least one chamferred orifice in said plate with said orifice in said first end of said main nozzle body to allow said centerbody to translate to a blocking position.

4,102,499

GAS TURBINE POWERPLANTS

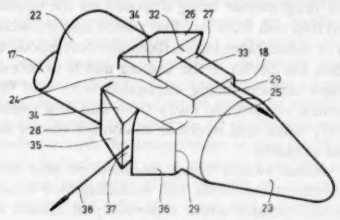
John Matthew Hall, Backwell, Nr. Bristol, England, assignor to Rolls Royce (1971) Limited, Great Britain

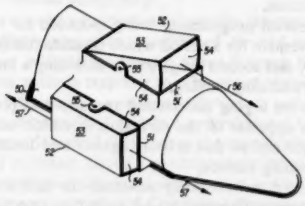
Continuation of Ser. No. 668,919, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 607,706, Aug. 25, 1975, abandoned. This application Sep. 22, 1977, Ser. No. 835,721

Claims priority, application United Kingdom, Sep. 7, 1974, 39171/74

Int. Cl.² B64C *15/04*

U.S. Cl. 239—265.27 **10 Claims**





1. A gas turbine powerplant having a nozzle capable of varying the direction of discharge of at least a part of a propulsive jet therefrom, the nozzle comprising a wall defining a duct for the propulsive jet, an aperture in the wall, means closing the duct aft of the aperture and a substantially u-shaped flap member pivotally connected about its middle to side edge means of the aperture for pivotal movement relative to the wall, said flap member being pivotable between two extreme positions to define two discharge orifices differently orientated with respect to the duct, one said extreme position correspond-

ing to an orifice arranged to discharge gases in an upstream direction, the other said extreme position corresponding to an orifice arranged to discharge gases in a downstream direction, and there being an intermediate position in which there are defined two discharge orifices capable of discharging equally in upstream and downstream directions.

4,102,500

APPARATUS FOR SPRAYING LIQUIDS

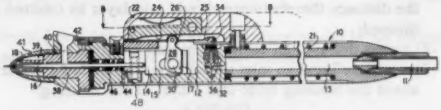
Stanley Herbert Luff, Hull, England, assignor to Humbrol Limited, Hull, England

Filed Dec. 6, 1976, Ser. No. 748,014

Claims priority, application United Kingdom, Dec. 9, 1975, 50341/75

Int. Cl.² B05B 7/12

U.S. Cl. 239—345 **1 Claim**



1. In the known type of air brush comprising a housing containing a discharge orifice, passageways for supplying air and liquid to said orifice, a needle valve for controlling the flow of liquid to said discharge orifice, and control means to regulate the position of said needle valve with respect to said orifice, the improvement consisting of control means that includes

(a) a slide member adapted to slide along an exterior portion of said housing, a portion of the inner surface of said slide member constituting a cam surface,

(b) a lever pivotally mounted within said housing, said lever having

(1) a first portion that constitutes a cam follower which is adapted to engage said cam surface of said slide member, and

(2) a second portion that is adapted to bear against an extension on the inner end of said needle valve so as to move said needle valve to a progressively greater open position in a predetermined manner,

(c) means for normally biasing said slide member toward a position wherein the interaction of said cam surface and said cam follower will permit said needle valve to shut off the liquid passageway to said discharge orifice.

4,102,501

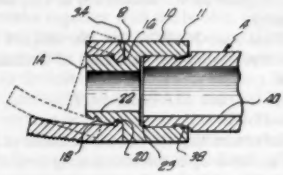
DEFLECTOR ASSEMBLY FOR A SPRAY GUN

Jacob De Gelder, Rancho Palos Verdes; William Harvey Hill, Carson, and Ronald F. Englhard, Mission Viejo, all of Calif., assignors to The Leisure Group, Los Angeles, Calif.

Filed Dec. 16, 1976, Ser. No. 751,533

Int. Cl.² B05B 1/26

U.S. Cl. 239—511 **16 Claims**



1. A deflector assembly adapted to being mounted on a sprayer nozzle comprising;

a mounting collar, capable of being operatively connected to a spray nozzle, having a first pivotal mounting connector and at least a pair of detents, and

a deflector blade having a complimentary second pivotal mounting connector operatively connected to the first pivotal mounting connector and a locking tine for selective engagement with the detents, whereby the deflector blade is pivotally mounted on the mounting collar for rotation about the respective mounting connectors to provide at least one deflecting position within the flow pattern of the nozzle.

4,102,502

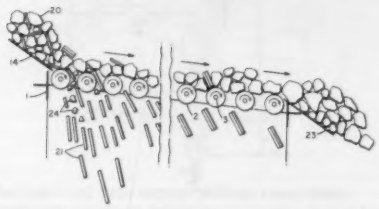
CONCENTRATION OF PLATE-SHAPED MINERALS

Gary Gene Vaplon; Edwin Erickson, both of Libby, Mont., and Joseph L. Young, Santo Domingo, Dominican Republic, assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 10, 1976, Ser. No. 749,237

Int. Cl.² B02B 23/18

U.S. Cl. 241—4 **14 Claims**



1. The method of separating minerals which when mined are in the form of plate-shaped particles from other non-plate shaped constituents of the mined mineral ore, said method comprising the steps of;

(a) providing a bed formed by the surfaces of a plurality of spaced rotating rolls arranged generally horizontally along one side another, the axes of said rolls being substantially parallel and the direction of rotation of each roll being the same;

(b) depositing said mined mineral ore onto said bed of rolls;

(c) aligning the flat surfaces of said plate-shaped particles along the surfaces of said rotating rolls thereby causing a substantial portion of said plate-shaped mineral particles in said mined ore to pass through the spaces between said rolls while at the same time conveying a substantial proportion of said non-plate shaped constituents of said ore along the surfaces of said rolls in the direction of rotation of said rolls, and

(d) collecting the said plate-shaped mineral particles passing through said spaces in a zone beneath said bed of rolls, and collecting said non-plate shaped constituents in a zone near the end of said bed.

4,102,503

METHOD OF AND APPARATUS FOR THE LOW-TEMPERATURE MILLING OF MATERIALS

Helmut Meinass, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation of Ser. No. 676,666, Apr. 14, 1976, abandoned. This application Jul. 6, 1977, Ser. No. 813,411

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516764

Int. Cl.² B02C 23/06

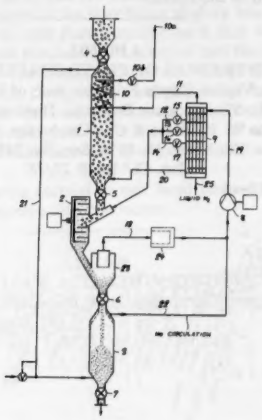
U.S. Cl. 241—18 **7 Claims**

1. A process for comminuting cold-embrittable material comprising the steps of:

(a) chilling said material to a temperature sufficiently low to embrittle it by passing it in direct heat exchange with a cooling gas;

(b) entraining the chilled material through a mill in a carrier

gas which can be of the same composition as said cooling gas and in which said chilled material is milled and the milled product is conveyed out of the mill;
(c) separating said milled product from said carrier gas;
(d) continuously circulating said cooling and carrier gas upon the separation of said material therefrom in a gas stream over a closed path without venting or replenishment, said closed path including a compressor and a heat exchanger downstream of said compressor;



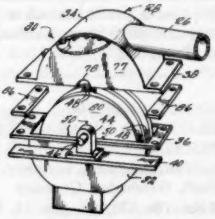
(e) cooling said gas stream to a temperature of at most the temperature of step (a) by passing said gas stream at said heat exchanger in indirect heat exchange with a separately displaced coolant fluid;
(f) passing said coolant fluid after it has traversed said heat exchanger in indirect heat exchange with said material to precool the same; and
(g) venting said coolant fluid after it has precooled said material.

4,102,504

VIBRATORY HOPPER-FED, FLAIL-TYPE PULVERIZER

George W. Mushrush, 12903 Sturbridge Rd., Woodbridge, Va. 22192, and Thomas Schlemmer, Roswell Rd., Dellroy, Ohio 44620

Filed Sep. 30, 1976, Ser. No. 727,994
Int. Cl.[2] B02C *13/282*
U.S. Cl. 241—186 R 6 Claims



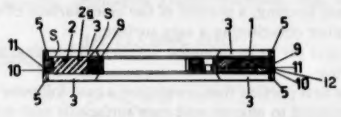
1. A flail-type pulverizer, comprising:
(1) a shaft;
(2) bearing means journalling the shaft for rotation;
(3) a plurality of elongated flails pivotally secured to said shaft to project generally radially therefrom;
(4) wall means providing a housing enclosing said flails, and including two opposite end walls and an outer peripheral wall extending between these end walls, the outer peripheral wall bearing a plurality of internal protuberances against which particles being flung by said flails may impact in order to effect particle size reduction;
(5) said housing being provided in at least two angularly adjoining portions, one of which is removable from the other and this removable portion including an angularly substantial part of said outer peripheral wall including many of said protuberances;
(6) means for removably securing said two housing portions together with said protuberances radially adjacent said flails;
(7) at least one layer of bushing material removably received between said two housing portions, for spacing the two housing portions slightly apart, thereby effectively increasing the distance between the radially outer extents of the flails and said protuberances on the outer peripheral wall of the removable portion of the housing, compared to the distance therebetween should said layer be omitted or thinned;
(8) means defining an outlet from said housing; and
(9) means defining an inlet to said housing, spaced angularly about the housing from said outlet of the housing.

4,102,505

PULP REFINING DISK

Franco Del Sarto, Sao Paulo, Brazil, assignor to Inox Industria E. Comercio de Aco S/A, Sao Paulo, Brazil

Filed Mar. 16, 1977, Ser. No. 778,050
Claims priority, application Brazil, Dec. 8, 1976, 08232; Dec. 8, 1976, 08233
Int. Cl.[2] B02C *7/12*
U.S. Cl. 241—297 7 Claims



1. An improved pulp refining disk comprising a circular rigid plate, means defining axial passages in the plate, an array of spaced-apart winglets projecting up from one face of the plate so as to define an array of grooves between the winglets, each said winglet having opposite ends and a bottom edge, each said winglet extending over a said passage, means for anchoring the edge of each winglet to the plate at a location in a said passage, a settable lightweight plug filling each said passage and means integral with the plate for securing the disk to a refiner.

4,102,506

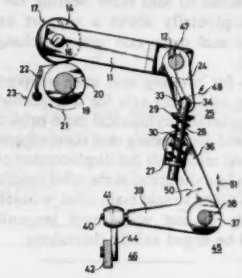
DEVICE FOR CONTROLLING THE CONTACT PRESSURE OF A TEXTILE COIL ON A SUPPORT OR DRIVING CYLINDER

Hans Raasch, and Hans Grecksch, both of Mönchen-Gladbach, Germany, assignors to W. Schlafhorst & Co., Monchengladbach, Germany

Filed Apr. 26, 1976, Ser. No. 680,299
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1975, 2518646
Int. Cl.[2] B65H *54/42*
U.S. Cl. 242—18 DD 8 Claims

1. Device for controlling the contact pressure of a textile coil on a support or drive cylinder, comprising articulatingly suspended coil holder means for rotatably supporting the coil over the cylinder, a toggle-joint assembly being movable in a given plane into positions thereof wherein it is partly and fully extended, said toggle-joint assembly including a lever articulatingly connected to said coil holder means and a foot member operatively connected to said lever, said foot member having

an end; and means for adjusting in said given plane the direction in which said toggle-joint assembly extends in said fully



extended position thereof, said adjusting means being located at said foot end of said toggle-joint assembly.

4,102,507

FORMATION OF RESERVE WINDING FOR FURTHER CONNECTION ON BOBBINS OF TEXTILE MACHINES

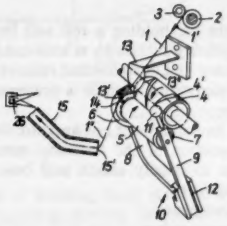
Herbert Hoffmann, Bremen, and Friedrich Wachendorf, Eggestedt, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sep. 15, 1976, Ser. No. 723,493

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541761

Int. Cl.² B65H *54/02*

U.S. Cl. 242—18 PW **12 Claims**



1. In a method for forming a tie on reserve winding on a bobbin which defines a yarn winding region and which is supported in a bobbin holder in a textile machine having a yarn supply device for supplying yarn to the bobbin during a winding operation in which, after severing of the yarn between a full bobbin and the yarn supply device, the yarn which continues to be supplied by the yarn supply device is drawn off by means of a suction device and, after replacement of the full bobbin by an empty bobbin in the bobbin holder, the yarn is brought into engagement with a hook-shaped catch element which is located between the yarn supply and suction device and which rotates together with the bobbin, said method comprising: moving the inlet end of the suction device, together with the yarn portion entering the suction device, in a direction parallel to the axis of the bobbin for causing the yarn, after it leaves the yarn supply device, to be directed by the suction action of the suction device in a direction such that it intersects the plane of rotation of the catch element at the diameter at which the catch element is located; immediately after the catch element has caught the yarn transferring the winding yarn coming from the yarn supply device into the winding region and causing the yarn to be wound there; and, simultaneously with said transferring of the winding yarn extracting the yarn located downstream of the catch element from the suction device and deflecting that yarn in a direction toward the bobbin so as to form a reserve winding on the bobbin adjacent, and axially spaced from, the winding region.

4,102,508

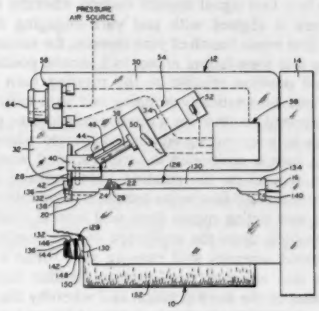
YARN SUPPLY PACKAGE AND METHOD AND APPARATUS FOR THE WINDING THEREOF

Albert F. Stegelman, Borger, Tex., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Jun. 27, 1977, Ser. No. 810,337

Int. Cl.² B65H *54/02, 54/34, 55/00, 55/04*

U.S. Cl. 242—18 PW **10 Claims**



1. An improved yarn supply package comprising:

rotatable yarn package holder means having first and second end portions for receiving yarn wound thereon;

a first waste bunch of yarn wound on said yarn package holder means adjacent the first end portion thereof;

a second waste bunch of said yarn connected to said first waste bunch and wound on said yarn package holder means intermediate said first waste bunch and the second end portion of said yarn package holder means, said second waste bunch being spaced a distance from said first waste bunch; and

a main yarn package of said yarn connected to said second waste bunch via a transfer tail of said yarn and wound on said yarn package holder means intermediate said second waste bunch and the second end portion of said yarn package holder means, said main yarn package being spaced a distance from said second waste bunch.

4. A method of producing a package of yarn on a yarn package holder assembly comprising a bobbin having first and second end portions and a removable start-up insert mounted on the first end portion thereof, said method comprising the steps of:

rotating a yarn package holder assembly;

engaging a running yarn on the start-up insert of the rotating yarn package holder assembly;

winding said running yarn on the rotating start-up insert to form a first yarn waste bunch thereon;

moving said running yarn from the first yarn waste bunch to the first end portion of the bobbin;

winding said running yarn on the first end portion of the rotating bobbin to form a second yarn waste bunch thereon;

moving said running yarn from the second waste bunch along the rotating bobbin to form a transfer tail on the bobbin; and

winding and traversing said running yarn on the rotating bobbin intermediate said transfer tail and the second end portion of the bobbin to form a main yarn package thereon.

6. In a continuous delivery yarn winding device of the type which includes chuck means for rotatably supporting at least one yarn package holder, drive roll means for rotating a yarn package holder supported by said chuck means, and yarn

traversing means for traversing a running yarn during the winding thereof upon a yarn package holder to form a main yarn package, the improvement comprising:

yarn tailing means for engaging a running yarn and positioning said yarn relative to a rotating yarn package holder;

yarn engaging means on a first end portion of said yarn package holder for engaging said running yarn whereby said yarn is initially wound about said yarn engaging means adjacent the first end portion of said rotating package holder;

control means operatively connected to said yarn tailing means for positioning said yarn tailing means in first position relative to the rotating yarn package holder in response to a first signal applied thereto whereby said running yarn is aligned with said yarn engaging means to form a first waste bunch of yarn thereon, for automatically moving said yarn tailing means to a second position from said first position relative to the rotating yarn package holder and automatically stopping said yarn tailing means at said second position for a predetermined time period in response to a second signal applied thereto whereby said running yarn is positioned to form a second waste bunch of yarn wound on the rotating yarn package holder a distance from said first waste bunch, and for automatically moving said tailing means from said second position to a third position upon the expiration of said predetermined time period whereby said running yarn forms a transfer tail on said rotating yarn package holder during said movement to the third position and whereby the running yarn is so positioned as to be engaged by said traversing means for traversing said running yarn along said rotating yarn package holder to form a main yarn package and said tailing means is disengaged from said running yarn.

4,102,509

FILAMENT FEEDING APPARATUS AND METHOD

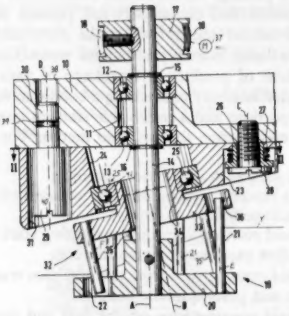
Horst Paepke, Fasanenweg 30, 7407 Rottenburg, Neckar, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,586

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610709

Int. Cl.[2] B65H *51/24, 51/26*

U.S. Cl. 242—47.04 **12 Claims**



3. An apparatus for advancing a filament, said apparatus comprising:

a main bearing defining a fixed main rotation axis;

a main support rotatable in said main bearing about said main axis;

an annular main array of main rods centered on and generally parallel to said main axis;

a skew bearing defining a skew axis adjacent and inclined at an acute angle to said main axis;

a skew support rotatable in said skew bearing about said skew axis;

an annular skew array of skew rods centered on and generally parallel to said skew axis and interleaved with said main rods, said main rods being operatively rotationally engaged with said skew array;

means connected to said skew bearing for displacing said skew axis pivotally about a support axis substantially parallel to said main axis without changing said acute angle; and

drive means for rotating said main support and said main rods about said main axis for displacement of said main rods in a generally cylindrical main orbit centered on said main axis and for rotating said skew support and said skew rods via said main rods for displacement of said skew rods in a generally cylindrical skew orbit centered on said skew axis and inclined to said main orbit, whereby a filament fed tangentially to and withdrawn tangentially from said orbits will be urged axially therealong.

4,102,510

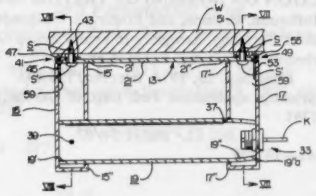
ROLL HOLDER MEANS

James Ralph Anderson, 4030 Cliffdale, Memphis, Tenn. 38127

Filed Aug. 1, 1977, Ser. No. 820,752

Int. Cl.[2] B65H *19/00*

U.S. Cl. 242—55.2 **9 Claims**



1. Holder means for holding a roll and for being fixedly attached to a supporting surface by at least one fastening member in such a manner that unauthorized removal of said holder means from the supporting surface is prevented, said holder means comprising:

(a) base means having at least one aperture therethrough for allowing a portion of the fastening member to extend therethrough to fixedly attach said base means to the supporting surface;

(b) a first arm member;

(c) a second arm member;

(d) a bar member for extending through the roll; and

(e) attachment means for fixedly attaching said bar member and said first and second arm members together and for fixedly attaching said first and second arm members to said base means with one of said arm members completely covering said aperture through said base means through which a portion of the fastening member extends to prevent access to the fastening member when said bar member and said first and second arm members are fixed in place thereby preventing unauthorized removal of said holder means from the supporting surface.

4,102,511

TURRET FOR WINDERS AND UNWINDERS

Leonard C. Krimsky, Spring Valley, and Henk Van Rietschoten, Monroe, both of N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

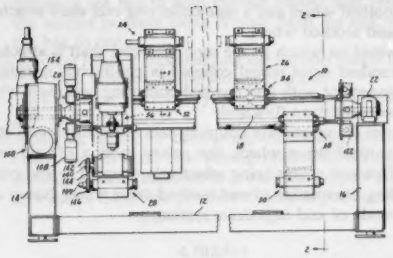
Filed Dec. 11, 1975, Ser. No. 639,970

Int. Cl.[2] B65H *19/06*

U.S. Cl. 242—64 **8 Claims**

2. In a winding or unwinding turret apparatus including a roll stand, a main shaft, means mounting said main shaft on said stand for rotary movement around an axis, a roll supporting arm, a pair of cylindrical rods, means mounting said rods on one of said shaft and said arm at circumferentially spaced

locations around said shaft and with the longitudinal axes thereof generally parallel to said shaft axis, and respective rolling bearing means between said rods and the other of said



shaft and said arm for mounting said arm on said shaft for rotary movement therewith and for movement in the direction of said shaft axis.

4,102,512

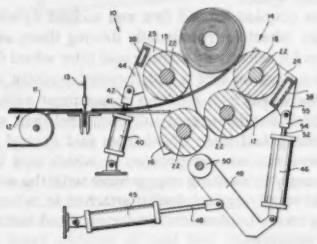
SYSTEM FOR FORMING SHEET MATERIAL INTO SPIRAL ROLLS

Michael Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

Filed May 11, 1977, Ser. No. 795,772

Int. Cl.[2] B65H *17/12*

U.S. Cl. 242—66 **8 Claims**



8. A method of forming sheet material and the like into a spiral roll comprising moving the sheet material along its length between a lower roller and an upper roller into a space defined by a group of at least one lower and at least two upper rollers arranged parallel to one another and in a cluster, rotating the rollers of the cluster of rollers in the same direction of rotation to form the sheet material into a spiral roll, pivoting at least one upper roller of the cluster of rollers away from the space to open the cluster of rollers at the top in response to an increase in the size of the spiral roll of sheet material, and supporting the spiral roll of sheet material first on the lower roller in the cluster of rollers and subsequently on the upper rollers in the cluster as the size of the spiral roll of sheet material increases.

4,102,513

FILM WRAPPING DISPENSER

Twyman Guard, 795 S. Alton Way, Denver, Colo. 80231

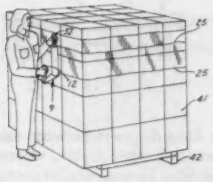
Filed Sep. 14, 1977, Ser. No. 833,138

Int. Cl.[2] B65H *23/06*; B44C *7/00*

U.S. Cl. 242—75.4 **21 Claims**

1. A film dispenser comprising:

reel means including a pair of opposed, rotary end supports mounted on a support shaft for supporting a roll of film for rotation relative to said shaft, one of said rotary end supports being movable along said shaft toward and away from the other of said rotary end supports to clamp the roll of film between said rotary end supports for conjoint rotation of said rotary end supports and said roll relative to said shaft, said reel means having a hand grip means attached to said support shaft by which said reel means is hand-held for pulling on the film while an end portion of the film is held on an object during the wrapping of the film about the object to unwind the film under tension, said hand grip means including a first hand grip operatively associated with said one rotary end support to move said one rotary end support along said support shaft to clamp the roll between said pair of rotary end supports and to urge the other of said rotary end supports against a friction surface opposite said one rotary end support to set the tension and to change tension on the film during said wrapping by the movement of said first hand grip.



4,102,514

MINIATURE TAPE CASSETTES

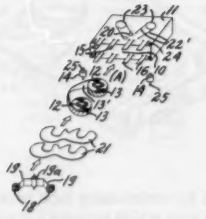
Kazuo Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 12, 1977, Ser. No. 815,018

Claims priority, application Japan, Jul. 12, 1976, 51/82731

Int. Cl.[2] G11B *23/10*

U.S. Cl. 242—199 **8 Claims**



1. A minature tape cassette comprising an integral one-piece drawn sheet metal casing having an upper wall, lower wall and side walls, one side of said casing being open, said upper wall and lower wall having aligned holes for rotatable receiving hubs of tape spools, and tape spools with tape thereon disposed between said upper wall and lower wall with the hubs thereof rotatably received in said holes, one of said upper wall and lower wall having integral spring strips extending from said holes toward said open side of said casing for insertion of said spools into said casing from the open side thereof for reception of said hubs in said holes.

4,102,515

TAPE CASSETTE

Lodewijk Luciaan Milants, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 539,462, Jan. 8, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,683

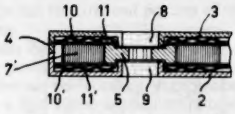
Claims priority, application Netherlands, Feb. 1, 1974, 7401403

Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*

U.S. Cl. 242—199 **2 Claims**

1. A cassette for magnetic recording tape, comprising a

casing having a bottom wall, a cover wall, and side walls; two winding hubs for winding and unwinding the tape respectively, fitted within the casing, and adapted for receiving a tape winding about said hubs between the bottom and cover walls; first and second corrugated films located between the tape winding and said bottom and cover walls respectively; and first



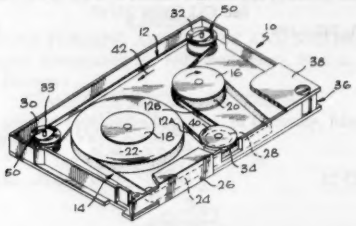
and second flat films disposed between said corrugated films and said tape winding respectively, wherein said corrugated films are resilient films having parallel corrugations and having a material composition, thickness, corrugation height and number of corrugations per centimeter selected to produce a spring constant having value between approximately 100 and 400 grams/mm.

4,102,516

TENSIONING MEANS FOR BELT DRIVEN TAPE CASSETTE

Noah L. Anglin, and Robert H. Berry, both of San Jose, Calif., assignors to Information Terminals Corporation, Sunnyvale, Calif.

Filed Apr. 14, 1977, Ser. No. 787,389
Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—199 **5 Claims**



1. Apparatus for maintaining tape tension in a belt driven cartridge of the type which includes a cartridge housing, a pair of reels for holding rolls of magnetic tape, said reels rotatably mounted on the housing, and an endless belt extending partially about the rolls of tape on the two reels, about a drive roller, and about a pair of corner belt rollers, each corner belt roller being rotatably supported on a corner roller shaft, comprising:

a bowed washer having a middle portion with a hole receiving a corner roller shaft, a pair of washer end portions bearing against a portion of said housing, and a middle washer portion bearing against said corner belt roller, whereby to apply a small but definite drag to the corner belt roller.

4,102,517

TAPE DRIVING APPARATUS FOR TAPE PLAY-BACK AND/OR RECORDING DEVICES

Rodolfo Cicatelli, Gandria, Switzerland, assignor to Autovox S.p.A., Rome, Italy

Filed Sep. 3, 1976, Ser. No. 720,399
Claims priority, application Italy, Sep. 10, 1975, 51283A/75
Int. Cl.[2] G11B *15/30, 15/29*
U.S. Cl. 242—201 **8 Claims**

1. A tape drive system for a tape playback and/or recording device, comprising:

a tape capstan;

a first driven flywheel coupled to said tape capstan, the rotary motion of said first flywheel being solely coupled to and controlling said tape capstan;

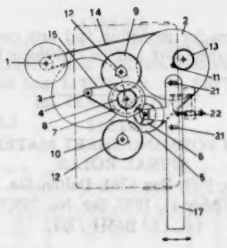
a toothed wheel and a tape collecting reel shaft attached to said toothed wheel;

a wheel on which a tape supplying reel shaft is attached;

a toothed drive wheel coupled in continuous meshing engagement with said toothed collecting reel shaft wheel;

a second driven flywheel;

means for selectively coupling said second flywheel to said toothed drive wheel, the rotary motion of said second flywheel means being selectively coupled to and controlling the rotation of said toothed drive wheel during a play mode of said tape drive system;



an idler wheel;

means coupled to said first and second flywheels and said idler wheel for rotationally driving them; and

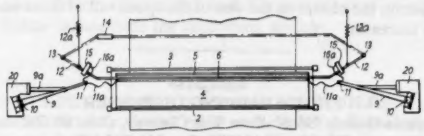
means for selectively shifting said idler wheel from a normal play position into a fast forward position in which said idler wheel is in meshing engagement with said toothed wheel that drives said collecting reel shaft wheel, and for shifting said idler wheel from said normal play position into a fast rewind position in which said idler wheel is directly in meshing engagement with the wheel to which said supplying reel shaft is attached to, wherein said shifting means implements fast forward and fast rewind modes of operation.

4,102,518

AIRCRAFT ARRESTING GEAR

Jean-Paul Bernard, Paris, and Paul Albert Meningand, Clamart, both of France, assignors to Aerazur Constructions Aeronautiques, Issy-les-Moulineaux, France

Continuation-in-part of Ser. No. 711,662, Aug. 4, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 835,930
Claims priority, application France, Aug. 6, 1975, 75 24507
Int. Cl.[2] B64F *1/02*
U.S. Cl. 244—110 C **5 Claims**



1. For use in association with an aircraft arrester gear, on an airstrip, of the kind including a pair of raisable posts mounted one at each side of the airstrip and an arrester net disposed across the airstrip and connected by a cable to the free end of the raisable posts, the invention which comprises:

i. a bag for positioning on the airstrip to enclose the arrester net in the lowered condition of the net

ii. support means for mounting at each side of the airstrip and

having a first position of movement and a second position of movement along the direction of the airstrip

iii. a retainer for positioning across the airstrip and secured to the support means, said retainer in the first position engaging the bag to hold the bag closed, said retainer in the second position being remote from the bag to allow the bag to open

iv. resilient loading means urging the support means to move from first position to the second position,

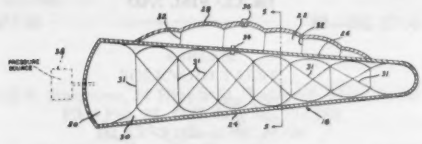
v. locking means releasably holding the support means in first position

vi. coupling means for connecting the locking means to the raisable posts such that during raising of the posts the locking means is actuated to release the support means for movement from first position to second position.

4,102,519
VARIABLE LIFT INFLATABLE AIRFOIL FOR TETHERED BALLOONS

Edward L. Crosby, Jr., Indialantic, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,822
Int. Cl.[2] B64B *1/42*
U.S. Cl. 244—125 **7 Claims**



1. In a tethered balloon having a body and an inflatable airfoil structure mounted on said body, the improvement residing in said inflatable airfoil structure, said airfoil structure comprising at least one inflatable horizontal fin, said fin being made up of a primary and a secondary chamber, said primary chamber being defined by a pair of non-rigid, gas retaining membranes and a plurality of supporting elements mounted therein, each of said supporting elements being secured between the inner surfaces of said pair of membranes in the spanwise direction, said secondary chamber being mounted on said primary chamber, said secondary chamber being defined by the outer surface of one of said membranes of said primary chamber, another non-rigid, gas retaining membrane and a plurality of supporting elements mounted therein, each of said supporting elements of said secondary chamber being secured between the outer surface of one of said membranes of said primary chamber and the inner surface of said membrane of said secondary chamber, a pair of valves, one of said valves being located within one of said membranes of said primary chamber and the other of said valves being located within said membrane of said secondary chamber, said pair of valves regulating the flow of gas within said secondary chamber and means operatively connected to said primary chamber for providing said primary chamber with a regulated flow of gas.

4,102,520
DUAL-PURPOSE EJECTOR FOR AIRCRAFT LOAD JETTISONING MECHANISM

Jean H. Hasquenoph, Lagny sur Marne, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed Nov. 8, 1976, Ser. No. 740,141
Claims priority, application France, Mar. 22, 1976, 76 08186
Int. Cl.[2] B64D *1/02*
U.S. Cl. 244—137 R **4 Claims**

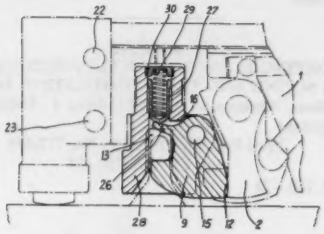
1. An ejector, for suspending loads under aircraft, comprising a carrier device having at each load suspension point:

i. a first hook pivotally mounted in said carrier device and shaped to co-act with a saddle suspension member of the load,

ii. a fastening means disposed in the vicinity of said first hook,

iii. a detachable device removably mounted in said fastening means, said detachable device comprising

a. a housing for receiving an upper part of a load ring,



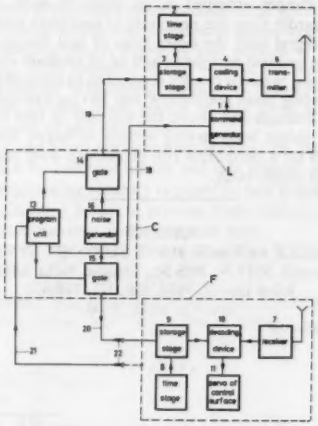
b. a second hook mounted on and pivotable about a horizontal pin and adapted in a closed position to lock said load ring in said housing, and

c. spring means urging said second hook against said first hook such that opening and closing movements of said first hook automatically cause opening and closing movements of the second hook.

4,102,521
SYSTEM FOR SIGNAL CODING

Joachim Hermann, Munich, Germany, assignor to Boelkow Entwicklungen KG, Munich, Germany

Filed Oct. 12, 1962, Ser. No. 230,804
Int. Cl.[2] F41G *7/14, 9/00, 7/00*
U.S. Cl. 244—3.11 **4 Claims**



1. In a system for the coding of guidance signals which are produced at a control center and after their coding transmitted to a body to be guided, a control center consisting of a command generator for producing the guidance signals, a coding unit for coding the guidance signals, a storage stage feeding the coding unit, said storage stage being controlled by a time stage, and a transmitter for transmitting the coded guidance signals to the body to be guided for actuating control surfaces therein, furthermore a receiver for the transmitted guidance signals, which receiver is arranged in the body to be guided, a decoding unit coupled to the receiver, a servo mechanism of the control surfaces of the body coupled to the decoding unit, a storage stage coupled to feed the decoding unit, a time stage

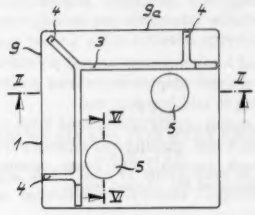
coupled to control the storage stage, and a code generator consisting of a noise generator and two gate circuits connected therewith, one of said gate circuits being connected to the storage stage of the control center and the other gate circuit being connected to the storage stage in the body to be guided, which last connection is provided with a releasable plug which disconnects said other gate circuit when the body to be guided is launched.

4,102,522

SUPPORTING ELEMENT FOR SUPPORTING MOUNTS IN A SOUND AND SHOCK INSULATING MANNER

Erich Munz, Weststrasse 11, 5204 Lohmar 1 - Geber, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,464
Int. Cl.[2] F16F *15/04*
U.S. Cl. 248—24 **2 Claims**



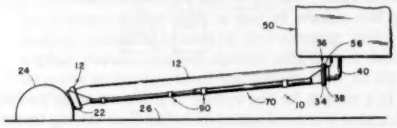
1. A separate unitary supporting element for supporting relatively heavy objects and machines in a sound and shock insulating manner, which includes in combination: a load distributing supporting plate having a top side and a bottom side, an angle-shaped abutment means fixedly connected to the top side of said supporting plate, comprising a pair of upwardly extending flanges arranged at an angle to each other and spaced inwardly from the periphery of said plate and reinforcing ribs integral with the outer sides of said flanges between said flanges and said periphery, and an oil resistant elastic body of elastomeric material fixedly connected to the bottom side of said supporting plate therebelow and having extension means extending through and above the top side of said supporting plate, said elastic body having serially arranged spaced nubs surrounded by a peripheral rim projecting from said bottom side of said elastic body.

4,102,523

VEHICLE SEWAGE HOSE SUPPORT SYSTEM

Everett Finnell, 5817 N. 29th St., Omaha, Nebr. 68111

Filed Dec. 8, 1976, Ser. No. 748,671
Int. Cl.[2] F16L *3/00*
U.S. Cl. 248—49 **5 Claims**



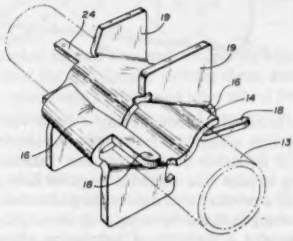
1. A sewage hose support system for recreational vehicles comprising an elongated support assembly module having right and left elongated hose-engaging portions having upwardly facing surfaces for engaging the right and left undersides of a sewage hose extending from a sewage outlet fitting on such a vehicle to a sewage disposeal pipe, said module having two lengthwise sections telescopically attached to each other so that said lengthwise sections can be chiefly disposed under different lengthwise sections of said hose, each lengthwise section of said system having portions defining parts of said right and left hose-engaging portions, and means engaging said module for supporting said module whereby said module can support said hose, said right and left hose-engaging portions being respectively formed by at least two right aligned telescoping members which latter are telescopically interconnected and by at least two left aligned telescoping members which latter are also telescopically connected and laterally spaced with respect to the length of said module from said two right telescoping members, and transverse flexible connecting means connecting said left telescoping members with said right telescoping members so as to prevent said right and left hose-engaging portions from spreading apart, said transverse connecting means comprising a plurality of flexible straps interconnecting said right and left hose-engaging portions, the flexibility of said straps making it possible for said right and left hose engaging portions to be moved laterally towards each other for storage and away from each other for use.

4,102,524

PIPE ANCHOR BRACKET

Zoltan Cseri, Northbrook, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 672,086, Mar. 31, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,838
Int. Cl.[2] F16L *5/00*
U.S. Cl. 248—56 **10 Claims**



1. A pipe anchor bracket comprising two substantially identical members which, when engaged, form a means for attaching pipes to other structures, each said bracket member having a body section with a portion thereof curved to accommodate the outside surface of the pipe to be supported, said body portion terminating at one end in a flange having an outside locking surface being sloped downward from the sides of the member to the center of the member and said body portion terminating at the other end in a curved flange re-curving back towards the body section having an inside locking surface being sloped downward from the sides of the member to the center of the member adapted to engage in a locking manner the outside locking surface of the other substantially identical member, said curved flange having a tab thereon adapted to secure the member to the other substantially identical member with a pipe therebetween, and said body section having two flanged projections each one extending generally at right angles from opposite sides thereof thereby providing welding surfaces for securing the member to a supporting structure.

4,102,525

KNOCKDOWN SUPPORT AND SPACER FOR BOOKSHELVES

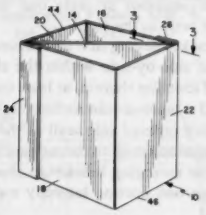
Robert Norman Albano, 5357 La Jolla Blvd., La Jolla, Calif. 92037

Filed Feb. 14, 1977, Ser. No. 768,217
Int. Cl.[2] A45D *19/04*
U.S. Cl. 248—174 **7 Claims**

1. A knockdown support column comprising:

a plurality of substantially rigid rectangular panels having top, bottom, and side edges,

hinge means connecting said panels along said side edges into a string having first and second end panels having a free edge and a plurality of intermediate panels, and



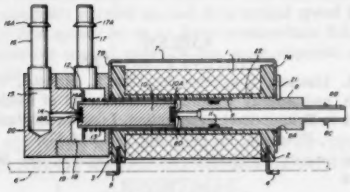
connecting means on said free edge for connecting said free edge to an intermediate one of said panels when said panels are hinged to a position for defining a four sided three dimensional column having a plurality of sides each defined by a separate one of said panels including said end panels, said end panels defining opposite sides of said column.

4,102,526

SOLENOID VALVE

Donald E. Hargraves, 54 Harbor St., Pepperell, Mass. 01463

Filed Feb. 23, 1977, Ser. No. 771,185
Int. Cl.² F16K *31/06, 11/04*
U.S. Cl. 251—139 **2 Claims**



1. In an electrically controlled valve of the type having

(1) a coil for establishing a magnetic field, the coil surrounding a core having through it a central longitudinal passage,

(2) a hollow elongate receiver extending into the central passage of the core,

(3) a pipe of magnetic material, the pipe extending into the central passage, the pipe being fixed to the receiver and having a port arranged to be closed by the seating of a member against the port,

(4) a plunger disposed to slide in the receiver, the plunger being magnetically attracted toward the pipe upon the establishment of a magnetic field by the coil and being adapted to seat against the aforesaid port of the pipe to close that port,

(5) a housing to which the receiver is attached, the housing having a first port therein, and

(6) means providing communication between the first port of the housing and the aforesaid port of the pipe when that port is open,

the improvement wherein

the core has a pair of spaced flanges between which the coil is situated, each flange having a flat face adapted to seat against a supporting surface such as a printed circuit board, and

the improvement further comprising

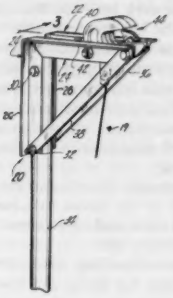
electrical terminals extending from the flanges, the coil being electrically connected to those terminals whereby the coil can be electrically energized.

4,102,527

GRIPPING PRY TOOLS FOR DISLODGING CONCRETE FORMS AND THE LIKE

Dewey D. Alexander, 18898 Lumpkin, Detroit, Mich. 48234

Filed Jun. 9, 1977, Ser. No. 804,907
Int. Cl.² B66F *15/00*
U.S. Cl. 254—131 **6 Claims**



1. A gripper pry tool comprising:

a tool frame;

a tool handle affixed to said tool frame and extending therefrom;

said tool frame including portions thereof extending transversely to said tool handle a lesser distance than the length of said tool handle;

a gripper mechanism mounted to said tool frame portions, said gripper mechanism including means to receive and grip a sheet member lying in a plane generally extending transversely to said tool handle, said means including gripper jaws having an opening therebetween extending transversely to said tool handle to thereby be adapted to receive a portion of a sheet member to be pried extending transversely to said tool handle, said means further including clamping means engaging said portion of said sheet member upon insertion of said portion into said opening and resisting withdrawal thereof to securely grip the inserted portion upon prying of said sheet member by movement of said tool handle;

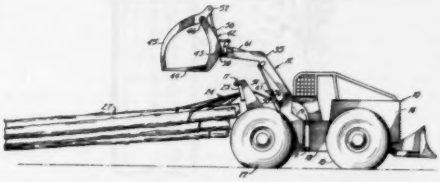
whereby said sheet member may be pried by the leverage afforded by said tool handle and said gripper mechanism jaws while being securely engaged by said gripper mechanism clamping means to prevent transverse movement of said sheet member away from said tool.

4,102,528

COMBINED LOG SKIDDER AND LOADER

Gerald Edwin Cripe, Rte. 1, Troy, Mont. 59935

Filed Feb. 14, 1977, Ser. No. 768,156
Int. Cl.² B66C *1/42*
U.S. Cl. 254—139.1 **3 Claims**



1. In combination with wheel tractor of the type including an articulated tractor framework having forward and rearward pair of ground engaging wheels respectively supporting forward and rearward sections of the framework, the forward and

rearward sections being pivoted with respect to one another about an upright axis;

said framework having an upright log skidding arch mounted to the rearward section thereof for playing out and taking up a winchline from a powered winch on the rearward section of the framework;

the improvement comprising:

a loader framework mounted to the rearward section of the tractor framework between the rearward pair of wheels and astride the log skidding arch;

a pair of elongated boom members pivotally mounted to the loader framework at opposite sides of the skidding arch about a common horizontal boom axis positioned forward of the rearward pair of wheels, said boom members extending outward from said boom axis in parallel upward and rearward directions to free boom ends that clear the skidding arch;

a pair of log grapples mounted to the free boom ends about axes parallel to the boom axis, said log grapples being operative to open and close about one or more logs for loading purposes; and

cylinder means connecting the loader framework and the boom members, for lifting and lowering the boom members and grapples by pivotal movement thereof about the boom axis;

said cylinder means comprising:

individual hydraulic cylinder assemblies at each side of the skidding arch, each cylinder assembly including a cylinder body and an extensible piston member;

the respective cylinder assemblies being located beneath and to the rear of the boom members;

the respective cylinder bodies each being pivotally mounted to the loader framework about a common pivot axis that is both parallel to and spaced from said boom axis;

the outer ends of the respective piston members being pivotally mounted to the boom members about a common axis that is both parallel to and spaced along the boom members outward from the boom axis;

whereby the log grapples mounted to the boom members are capable of being raised in a forward direction about the boom axis in response to pivotal movement of the boom members due to extension of the piston members with respect to the cylinder bodies of the individual hydraulic cylinder assemblies.

4,102,529

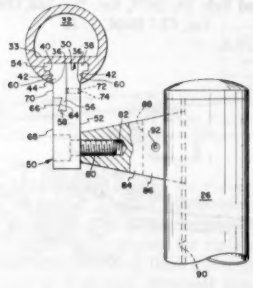
RAILING SYSTEM

Werner H. Neblung, 205 Cupsaw Lake Dr., Ringwood, N.J. 07456, and Gerhard O. Petrich, 41 Algonquin Way, West Milford, N.J. 07480

Filed May 6, 1977, Ser. No. 794,452

Int. Cl.[2] E04H *17/14*; A47H *1/14*

U.S. Cl. 256—70 **19 Claims**



1. In a mounting arrangement for a railing system:

a railing system member having a longitudinal slot therein, the slot including a longitudinal opening having a lateral width extending between opposite edges, a bottom face spaced inwardly of the opening and a transverse cross-sectional configuration which is at least partly wedge-shaped and is wider than the lateral width of the opening at locations spaced inwardly from the opening and tapers in the inward direction gradually laterally outwardly to said locations to establish at least one laterally outwardly tapered side wall in the slot;

a mounting bracket having first and second portions adapted to be placed side-by-side within the slot at any selected longitudinal location therein, at least one portion having a top face and a tapered side surface complementary to the corresponding tapered side wall of the slot;

actuating means adapted to be advanced relative to one portion of the mounting bracket to abut the other portion so as to urge one portion laterally away from the other portion; and

means for essentially precluding movement of the first and second portions relative to one another in the direction parallel to the inward direction so that the lateral movement of one portion away from the other portion will engage the complementary tapered mounting bracket side surface and slot side wall and urge the bottom face of the slot toward the top face of each portion of the mounting bracket to secure the railing system member and the mounting bracket in wedged engagement with one another.

4,102,530

ROTATING FURNACES

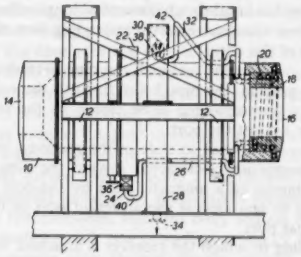
David A. Hawkes, Guisborough; Alan L. Robson, Middlesbrough, and Andray Uemlianin, Redcar, all of England, assignors to British Steel Corporation, London, England

Filed Jul. 11, 1977, Ser. No. 814,473

Claims priority, application United Kingdom, Jul. 16, 1976, 29778/76

Int. Cl.[2] C21B *7/10*

U.S. Cl. 266—46 **8 Claims**

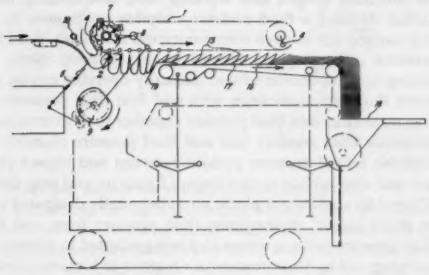


1. A method of treating material in a rotating generally cylindrical furnace having a charging end and a discharge end including the steps of supplying a cooling liquid to cool the discharge end by continuously passing said liquid through an annular coil at the discharge end, said liquid being delivered at an inlet end of the coil from an annular first trough surrounding the furnace and rotatable therewith to which the cooling liquid is supplied continuously and being impelled through the coil under centrifugal forces of rotation to discharge from an outlet end of the coil into a stationary annular second trough surrounding the furnace.

4,102,531
METHOD OF AND APPARATUS FOR FOLDING A SHEET TO FORM PAGES OF VARIABLE FORMAT

Pedro Jiminez, Evry, France, assignor to Ateliers de Constructions Mecaniques Seailles et Tison, Evryl-Ville-Nouvelle Ris-Orangis, France

Filed Jan. 24, 1977, Ser. No. 762,215
Claims priority, application France, Mar. 4, 1976, 76 06124
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **8 Claims**

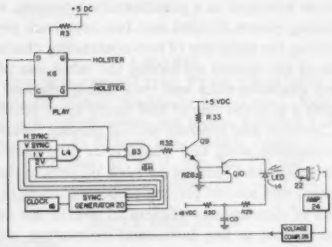


1. In a method of folding an elongate web to form the same into pages, the steps of:
(a) forming a series of first folds, to be located along respective first edges of the pages, by successively gripping parts of said web at intervals along its length;
(b) imparting a reversed ogival form to intermediate parts of said web between the said first folds;
(c) advancing the said first folds at a first speed while laying said intermediate parts of said web on a conveyor moving substantially parallel to, and at a second speed less than said first speed, so as to form intermediate folds along respective second edges of the pages opposite said first edges.

4,102,532
GAME METHOD AND APPARATUS FOR SENSING THE POSITION OF AN OBJECT WITH RESPECT TO ITS RECEPTACLE

Howard K. Van Jepmond, Menlo Park, and Ronald E. Milner, Grass Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1976, Ser. No. 738,669
Int. Cl.[2] A63B *69/00*; G08B *21/00*
U.S. Cl. 273—1 E **8 Claims**



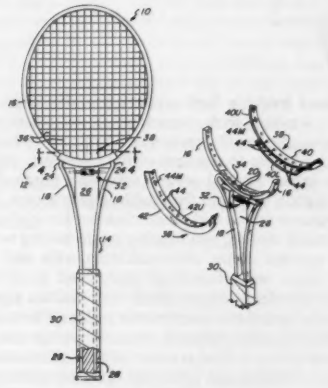
1. Video game apparatus for determining the position of a simulated weapon employed in the play of an amusement game with respect to a receptacle for said simulated weapon, comprising:
(a) video display means;
(b) a movable simulated weapon employed in the play of a video amusement game;
(c) a receptacle for said simulated weapon operatively connected to the video game;
(d) control means connected to a light source for propagating coded light, said light source being mounted on one of either the simulated weapon or the receptacle;
(e) optical detecting means for receiving the coded light propagated from the light source, said detecting means being mounted on one of either the simulated weapon or the receptacle but not coincident with the light source;
(f) circuit means connected between the light source and the optical detecting means for determining coincidence between the coded light propagated from the light source and the light received by the optical detecting means, said light source and said optical detecting means being positioned such that the position of the simulated weapon with respect to its receptacle is determinable from the receipt of the coded light as indicated by said coincidence; and
(g) means responsive to the circuit means for enabling the video display means.

5. A method for determining the position of a simulated weapon employed in the play of a video amusement game with respect to a receptacle for said simulated weapon, comprising the steps of:
(a) positioning a light source on one of either the simulated weapon or the receptacle each of which is employed in the play of the video amusement game;
(b) positioning an optical detecting means on one of either the simulated weapon or the receptacle but not coincident with the light source;
(c) coding the light propagated from the light source;
(d) determining whether the coded light propagated from the light source is received by the optical detecing means;
(e) aligning the light source with respect to the optical detecting means such that the coded light is received by the optical detector when the simulated weapon is received in its receptacle; and
(f) enabling the video amusement game consequent to detection of the coded light.

4,102,533
ADJUSTABLE HEAD RACQUET FRAME

Noble N. Ida, Boulder, Colo., assignor to Ida Engineering, Inc., Littleton, Colo.

Filed May 5, 1977, Ser. No. 793,739
Int. Cl.[2] A63B *51/12*
U.S. Cl. 273—73 E **12 Claims**



1. The stringable racquet frame which comprises: an elongate rod-like member having end portions connected by a medial portion, one of said end portions being bent and crossed over the other of said end portions to form a loop in said medial portion, said loop having arcuate sections adjoining said end

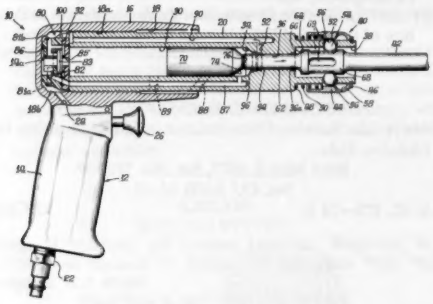
portions, said arcuate sections being arranged in side-by-side overlapping relation, said end portions being bent at points adjacent said overlapped sections to define a pair of limbs extending radially outward from said overlapped sections in side-by-side spaced relation so as to cooperate with one another and with said overlapped sections to form an open throat at the junction between said limbs and loop, said limbs lying in coplanar relation to one another and to said loop, said loop having a plurality of spaced apertures therearound for the reception of strings, and said overlapped sections having the opposed surfaces thereof recessed to produce at least one gap therebetween sized, shaped and positioned to pass the strings therethrough while permitting relative arcuate movement between said surfaces in opposite directions so as to both expand and reduce the size of said loop; handgrip-forming means fastening the limbs together at a point spaced from the base of the loop, said handgrip-forming means and limbs cooperating with one another to define a handle; and string tension adjustment means operatively connected between the limbs across the throat, said tension adjustment means being effective upon actuation in a direction to spread said limbs apart to reduce the size of said loop and reduce the tension in said strings, and said tension adjustment means being effective upon actuation in a direction to close the gap between said limb to enlarge said loop and increase the string tension.

4,102,534

PNEUMATIC HAMMER

Neil W. Benedict, Evanston, Ill., and Robert J. White, West Bloomfield, Mich., assignors to Ajax Tool Works, Inc., Franklin Park, Ill.

Filed Jan. 10, 1977, Ser. No. 757,871
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—137 **7 Claims**



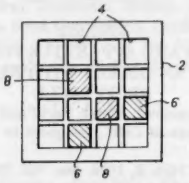
1. A hand holdable fluid pressure operated impact tool for use with a working tool, comprising, in combination, housing means defining a handle portion and having first fluid passage means connectable to a source of fluid pressure, said housing means including a barrel portion defining a piston chamber in communication with said first fluid passage means, an impact piston disposed within said piston chamber for axial reciprocating movement therein, said housing means having second fluid pressure passage means communicating with said first fluid passage means and adapted to apply fluid pressure against opposite ends of said impact piston, valve means supported by said housing means and cooperative with said first and second fluid pressure passage means to alternately subject the opposite ends of said piston to fluid pressure so as to effect reciprocating movement of said piston when said first fluid passage means is connected to a source of fluid pressure, manually operable means cooperable with said first fluid passage means to selectively control fluid pressure to said first fluid pressure passage means causing said impact piston to reciprocate irrespective of the position of said working tool, working tool mounting means cooperative with said housing means to mount a working tool on said housing means such that the axis of said working tool is aligned with the direction of movement of said impact piston, said working tool mounting means facilitating longitudinal movement of said working tool relative to said housing means between a first position wherein said working tool may be engaged by said impact piston and a second position where said working tool cannot be engaged by said impact piston so that said working tool must be moved to its said first position in order to effect impact with said piston, said housing means defining an annular stop surface at the forward end of said piston chamber to limit movement of said impact piston in the direction toward said working tool, said housing means further defining a fluid pressure chamber contiguous to said stop surface and in open communication therewith, third fluid pressure passage means formed in said housing means and having upon operation of said manually operable means, continual fluid communication with said first fluid pressure passage means and said fluid pressure chamber so as to continually introduce fluid pressure into said fluid pressure chamber and establish a fluid pressure cushion between said impact piston and said stop surface so that impact forces on said stop surface effected by said impact piston are substantially dissipated prior to direct impact thereagainst, fluid pressure from said third fluid pressure passage means also being adapted to subject said working tool to fluid pressure in a manner to bias said working tool toward its said second position during operation of said impact tool.

4,102,535

BOARD GAME

Michael Kindred, Nottingham, England, assignor to Invicta Plastics Limited, Leicester, England

Filed Dec. 15, 1976, Ser. No. 751,051
Claims priority, application United Kingdom, Dec. 23, 1975, 52689/75
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—282 **3 Claims**

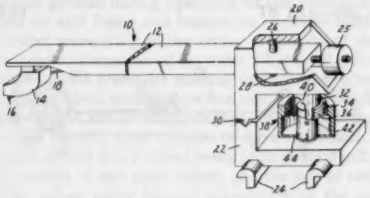


1. A board game for two players comprising a board, said board having means defining a plurality of playing piece receiving areas arranged in a predetermined pattern, a plurality of first playing pieces divided into two sets, each piece of the first set having the same one of two contrasting characteristics, each piece of the second set having the other one of said two contrasting characteristics and each being adapted to be received upon a selected one of said board areas according to a player's selection, and separate second playing pieces for each player cooperable with said board after first playing pieces have been positioned thereon by both players to determine a game winner, said second playing pieces including at least two plates each of dimensions sufficient to overlie the board once positioned therein in any horizontal orientation, a like numbered plurality of apertures in each of said plates, said plates being distinct with the arrangement of apertures in said second playing pieces being irregular and different among said plural second playing pieces, each aperture being alignable with one of said playing piece receiving areas through which apertures respective first playing pieces are viewable when a second playing piece is correctly positioned upon player selected playing piece receiving areas.

4,102,536
PHONOGRAPH PICKUP DEVICE

Kenneth Clunis, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 569,871, Apr. 21, 1975, abandoned. This application Sep. 15, 1976, Ser. No. 723,588
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 R 5 Claims



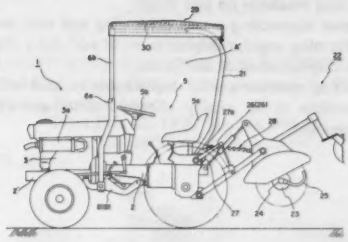
1. A pickup device for record players comprising
(a) a tone arm having a phonograph cartridge at one end,
(b) support means for pivotally supporting the tone arm for movement toward and away from a record disc surface,
(c) force applying means responsive to a drive signal for controllably applying a force to rotate the tone arm toward said record disc surface to bring said cartridge into contact with said record disc surface, and
(d) cueing control means for controlling the movement of said tone arm to said record disc surface comprising
(i) magnetic field providing means secured to the support means including inner and outer concentric pole faces, defining a gap therebetween which lies in the same plane as that of the pivot, and means providing magnetic flux to the pole faces such that a magnetic field extending across the gap is established,
(ii) a sense coil rigidly positioned on the tone arm such that when the cartridge is in contact with said record disc surface the coil is centered in said gap for generating a motion signal corresponding to the rate at which the tone arm moves,
(iii) circuit means for providing a control signal proportional to the difference between two signals, said circuit means having a reference potentiaL network for providing a reference signal as one of said two signals and having a feedback circuit connected to receive said motion signal and in response thereto providing a signal as the other of said two signals, and
(iv) drive means responsive to said control signal for producing a said drive signal for energizing said force applying means whereby rotation of the tone arm toward said record disc is electrically controlled.

4,102,537
SEATED-OPERATOR TYPE TRACTOR

Teizo Takahashi, Sakai; Toshiyuki Matsumoto, Yao; Tadashi Nakamura, Kawachinagano, and Ryozo Kuroiwa, Sakai, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 17, 1977, Ser. No. 778,503
Claims priority, application Japan, Jun. 23, 1976, 51-74872; Jun. 18, 1976, 51-81011[U]
Int. Cl. B62d *25/06*
U.S. Cl. 296—102 4 Claims

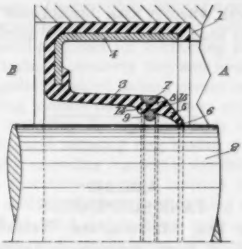
1. A seated-operator type tractor comprising a seat for the operator supported on a chassis framing of the tractor, a safety frame upstanding in gate form securely supported on either side of the chassis framing forwardly of the seat, said safety frame having detachable upper and lower portions interconnected at a level slightly higher than the top of a steering wheel on said tractor, and a rear safety frame, characterized in that said rear safety frame is formed in L or J letter shape and extends above and rearwardly of the seat, with one end fixed to a center top portion of safety frame and the other end detachably attached to a center portion of the rear of the tractor body.



4,102,538
LIP SEALING RING FOR A SHAFT

Jacques Bertin, Asnieres, France, assignor to Paulstra, Levallois-Perret, France

Filed Oct. 14, 1975, Ser. No. 622,227
Claims priority, application France, Oct. 21, 1974, 74 35321
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—153 9 Claims



1. In a shaft sealing joint comprising a sleeve of elastomeric material freely surrounding said shaft, having at one end a lip suitable for elastic contact with the shaft and being at the other end integral with a support, the improvement which comprises providing around said sleeve in the portion of said sleeve that joins the lip, an external rigid annular stiffening ring gripping around said sleeve on the external side of said portion and an internal rigid, annular stiffening ring, gripping around said sleeve on the internal side of said portion, said external rigid annular stiffening ring and said internal rigid annular stiffening ring being located opposite each other on substantially the same longitudinal axis in said portion so as to compress between them said sleeve of elastomeric material and form a neck in said portion.

4,102,539
POWER-ACTUATED CHUCK, ESPECIALLY FOR TURNING MACHINES SUCH AS LATHES

Günter Horst Röhm, Heinrich-Röhm-Str. 50, Sontheim, Fed. Rep. of Germany (7927)

Filed Jul. 12, 1977, Ser. No. 815,017
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631583
Int. Cl.[2] B23B *31/16*
U.S. Cl. 279—114 10 Claims

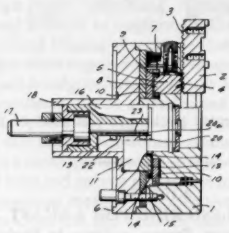
1. A power-actuated chuck for a turning machine, comprising:
a chuck body rotatable about an axis;

a plurality of jaws angularly spaced about said axis and radially displaceable on said body to engage and disengage a workpiece received between said jaws;

a drive ring rotatable on said body;

mechanism connecting a said drive ring and said jaws for transforming angular displacement of said drive ring into radial displacement of said jaws;

an actuating member axially displaceable on said body and connectible to an axially effective piston-and-cylinder arrangement;



a slider member displaceable on said jaw generally tangentially with respect to said ring and operatively connected thereto for angularly displacing said ring upon linear displacement of said slider member, one of said members being formed with a tooth inclined to said axis and the other of said members being formed with a groove receiving said tooth whereby axial displacement of said actuating member linearly shifts said slider member.

4,102,540

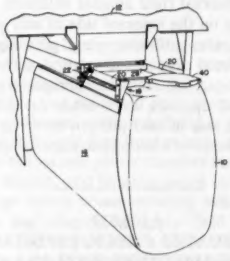
TANK SUSPENSION

Robert Eugene Fox, Minburn, and Wendell Dale Reece, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 7, 1977, Ser. No. 774,764

Int. Cl.² B60P *3/22*

U.S. Cl. 280—5 H **16 Claims**



1. An agricultural implement comprising: a main frame; transversely spaced apart fore-and-aft extending members carried by the frame; an elongated flexible tank receivable between said members; tank support means having transversely spaced fore-and-aft extending sides for respectively engaging the members, sliding therealong and resting thereupon; and means suspending the tank from the support means for limited transverse rocking movement, including a flexible saddle member wherein said receptacle is carried.

4,102,541

ROLLER SKIS

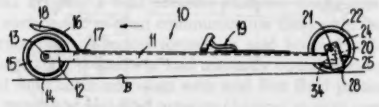
Hans Altorfer, Effretikon, and Oscar Knoll, Tagelswangen, both of Switzerland, assignors to Altorfer AG Metall- und Apparatebau, Illnau-Effretikon, Switzerland

Filed Feb. 3, 1977, Ser. No. 765,152

Claims priority, application Switzerland, Feb. 17, 1976, 1890/76

Int. Cl.² A63C *17/14*

U.S. Cl. 280—11.1 BT **10 Claims**



1. A roller ski equipped with a reverse motion-blocking device, comprising:

a support board having a front end and a rear end;

at least one front wheel mounted at said front end;

rear wheel means mounted at said rear end;

a reverse motion-blocking device embodying a pendulum support engaging with the ground, upon which travels the roller ski by means of the front wheel and said rear wheel means, during reverse motion of the roller ski;

means for hingedly connecting the pendulum support with the roller ski;

means providing two spaced stops carried by said support board at the region of its rear end adjacent the rear wheel means;

said hingedly connecting means mounting said pendulum support to be freely pivotable between said two stops;

said pendulum support having a free end; and

means for frictionally coupling the pendulum support at the region of its free end with said rear wheel means for rendering ineffectual the reverse motion-blocking device during forward motion of the roller ski.

4,102,542

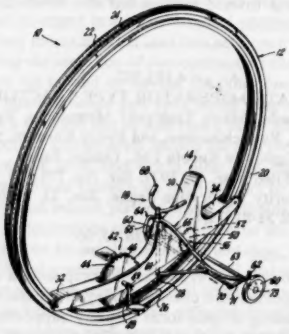
RIDER PROPELLED VEHICLE

Frank A. Pirre, Jr., 40 Elmwood Ave., Norwalk, Conn. 06854, and Andrew McGovern, Buckfield La., Greenwich, Conn. 06830, assignors to Frank A. Pirre, Jr., Norwalk and Andrew J. McGovern, Greenwich, both of Conn., part interest to each

Filed Jul. 2, 1976, Ser. No. 702,351

Int. Cl.² B62K *1/00*

U.S. Cl. 280—207 **15 Claims**



1. A rider propelled vehicle comprising an outer, large diameter wheel, a seat frame located within the periphery of said outer wheel, means for operatively connecting said seat frame to said outer wheel at two spaced points on the frame

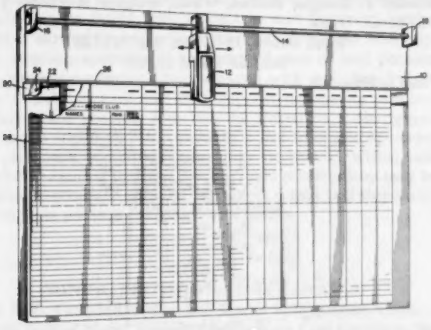
and for permitting said outer wheel to move through said frame at said two spaced points, means on said frame, including at least one foot pedal, operatively engaged with said outer wheel for rotating said outer wheel upon operation of said foot pedal by a person seated on said frame; said rotating means including a drive wheel rotatably mounted on said seat frame for rotation upon actuation of the foot pedal and being drivingly engaged with said outer wheel; a pair of laterally spaced ground engageable steering wheels located to continuously engage the ground during operation of the vehicle rotatably mounted on said frame and located on opposite sides of said outer wheel rearwardly of the center of gravity of the frame and the center of rotation of the outer wheel; and rider operable means on said frame for steering said steering wheels; and a single idler wheel mounted on said seat frame rearwardly of said drive wheel and drivingly engaged with said outer wheel for rotation thereby upon rotation of the drive wheel; the axis of rotation of said drive wheel being located forwardly of the axis of rotation of said outer wheel; and the axis of rotation of said idler wheel being located rearwardly of the center of gravity of said seat frame; said drive wheel having a larger diameter than said idler wheel; and said drive wheel and idler wheel being substantially equidistant from the center of gravity of said seat frame; whereby the axis of rotation of said drive wheel is closer to the center of rotation of the outer wheel than the axis of rotation of the idler wheel and the center of gravity of the seat frame is located rearwardly of the center of rotation of the outer wheel to resist forward undriven rolling of said outer wheel.

4,102,543

BRIDGE SCORING DEVICE

Samuel C. Smith, 210 Hartman Rd., Newton Centre, Mass. 02159

Filed Aug. 30, 1976, Ser. No. 718,847
Int. Cl.[2] G09B *19/22*
U.S. Cl. 283—49 **6 Claims**



1. An apparatus for scoring duplicate bridge comprising in combination:

(a) a plurality of identical score sheets each one having horizontal rows and vertical columns for recording the scores of each team with respect to a particular bridge hand, said rows and columns being so designed that the final score for each team with respect to that hand appears in the right-most vertical column of each sheet;

(b) a jacket for each said score sheet comprising an opaque rectangular paper, cardboard or plastic envelope just large enough to contain one of said score sheets in non-folded position and having a slit along one edge thereof for inserting or removing a score sheet;

(c) a substantially flat, rectangular, and generally-vertically positioned score board; and,

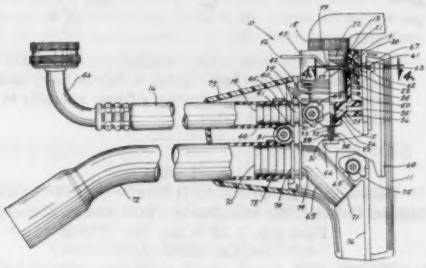
(d) means for fastening to aid score board a plurality of said score sheets in horizontally-aligned vertical overlapping relationship so as to expose only the right-most vertical column of each sheet, said means compising a horizontal support located along the vertically uppermost edge of said score board and a staple gun slidably mounted on said support.

4,102,544

RETAINING RING ASSEMBLY FOR FAUCET COUPLER

John D. Goodlaxson, Colfax, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Feb. 23, 1976, Ser. No. 660,321
Int. Cl.[2] E03C *1/00;* **F16L** *55/00*
U.S. Cl. 285—8 **12 Claims**



1. A coupler assembly for connecting a portable washing machine to a faucet disposed generally above a sink, the combination comprising: a coupler body defining a conduit having an inlet end for receiving said faucet and an outlet end connectable to said machine; means for connecting said inlet end to said faucet including a retaining ring and further including a plurality of angularly spaced locking means each including a portion extending radially outwardly from said coupler body and a portion extending through said body for engagement with said faucet, said retaining ring having angularly spaced radially inwardly extending segmental shoulders defining angular recesses therebetween, said recesses being generally alignable with said angularly spaced locking means in a first posture of said retaining ring to allow axial assembly of said retaining ring onto said coupler body, said retaining ring being rotatable to a second posture for at least partially aligning said shoulders with said locking means; means for maintaining said retaining ring in said second posture; and spring means for axially biasing said retaining ring to a faucet locking position, said retaining ring being axially retained on said coupler body by engagement of said locking means with said shoulders and being axially movable against said spring means while in said second posture from said faucet locking position to a faucet receiving-releasing position.

4,102,545

SLIDING DOOR LOCKING SYSTEM

Melvin C. Jay, Streamwood, Ill., assignor to Elgin-Macor, Inc., Elgin, Ill.

Filed Feb. 22, 1977, Ser. No. 771,612
Int. Cl.[2] E05C *5/02;* **E05D** *13/06*
U.S. Cl. 292—57 **11 Claims**

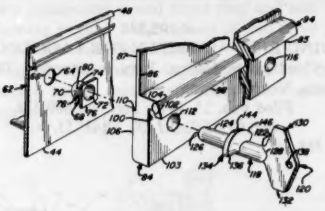
1. A security lock assembly for locking a movable panel to a stationary frame assembly, comprising:

first wall means defining a first aperture connected to said movable panel;

a bracket mounted to said stationary frame assembly including a leg having a cam-receiving portion and second wall means generally spaced from and overlying said first wall means, said second wall means defining at least one aperture positioned for alignment and registration with said first aperture; and

key means having a shank for rotatable and removable insertion into both said first aperture and said one aperture

when said first aperture and said one aperture are in alignment and registration, manually graspable head means connected to said shank for permitting grasping of said key means, and cam means carried by and extending from



said shank for interlocking engagement with said cam-receiving portion of said bracket to substantially lock said movable panel and said stationary frame assembly in fixed relationship to each other.

4,102,546

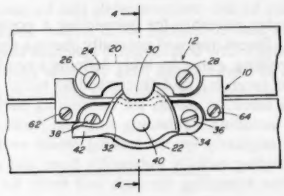
BURGLARPROOF GUARD FOR WINDOW LOCK

Michael Costello, 304 Meridian St., East Boston, Mass. 02128

Filed Sep. 2, 1976, Ser. No. 719,946

Int. Cl.[2] E05C *21/02*

U.S. Cl. 292—346 **3 Claims**



1. A guard for use with the existing lock elements of a double-hung window having upper and lower sashes, both with a cooperating lock element, comprising

(a) a unitary flat plate member adapted to be mounted between the top of said lower sash and the lower sash lock element,

(b) said member being formed with enlarged perforated end portions and a narrow elongated rib portion connecting said end portions, said rib portion being formed with an offset medial portion adapted to underlie the lock element on said lower sash when installed thereon,

(c) said member being flat throughout and formed with a contoured marginal edge including coplanar flat protrusions at opposite ends thereof adapted to extend over the gap between said sashes when closed and beyond the inner opposing edge of said upper sash,

(d) said edge being formed with a center recess to allow clearance for the other lock element when said window is being opened.

4,102,547

SCAVENGING DEVICE FOR ANIMAL WASTE

Rollin T. Williams, 224 N. Franklin St., Allentown, Pa. 18102

Filed Nov. 18, 1977, Ser. No. 852,662

Int. Cl.[2] A47F *13/08*; A01K *29/00*

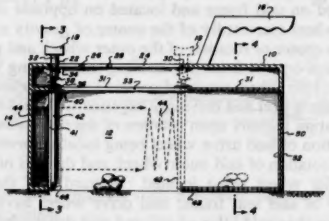
U.S. Cl. 294—1 R **10 Claims**

1. A device for scavenging and storing animal waste comprising:

(a) a generally parallelepipedal housing having a first outer top and a second inner top, a front wall, a rear wall, two side walls, and a partial bottom wall releasably attached to said housing;

(b) a scraper face plate slidably mounted within the housing between the sides along a path from proximate said front wall wherein said plate is in full open position to a position toward said back wall, proximate said bottom wall, wherein said scraper plate is in full closed position and thereby sealingly abuts said sides, said inner top and said bottom to form a waste receptacle compartment;

(c) tension means mounted between said front wall and connected to said scraper face plate so that said scraper plate is continuously urged toward said back wall;



(d) means extending through said inner and said outer top for releasably securing said scraper face plate at various locations along its path; and,

(e) handle means for carrying and positioning said device whereby when the device is rested on a generally planar surface with the open compartment of the bottom overlying the waste, movement of the scraper face plate from an open to a closed position pushes said waste into said waste receptacle compartment.

4,102,548

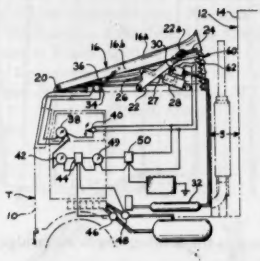
INFINITELY VARIABLE, CONTROLLABLY AND/OR AUTOMATICALLY ADJUSTABLE AIR DEFLECTOR AND METHOD

Timothy J. Kangas, Renton, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Dec. 6, 1976, Ser. No. 747,728

Int. Cl.[2] B62D *35/00*

U.S. Cl. 296—1 S **14 Claims**



1. A device for reducing aerodynamic drag on an automotive vehicle having a cab forward of a cargo compartment comprising:

air deflecting means mounted on the top of the cab and movable between a lower position closer to the top of the cab and in which air deflection is of one amount, and a higher position in which air is deflected in a greater amount from the top of the cab,

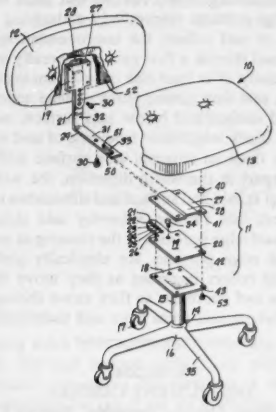
means for moving the air deflecting means, and

control means within the cab for actuating the moving means to vary the location of the deflecting means through various amounts of deflection between said lower and higher positions while the vehicle is traveling such that the air deflecting means may be placed into an optimum reduced drag position.

4,102,549
APPARATUS FOR ADJUSTING THE BACK SUPPORT OF A CHAIR

Andrew I. Morrison, Setauket, and Bruce R. Hannah, Cold Spring, both of N.Y., assignors to Knoll International, Inc., Greenwich, Conn.

Filed Apr. 13, 1977, Ser. No. 787,147
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—383 **3 Claims**

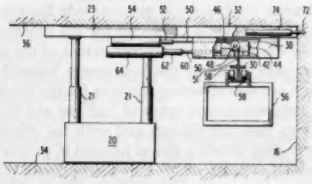


1. Apparatus for adjusting a back support member of flat rigid material forming a part of a chair, comprising a bracket through which said back support member slides, a position stop of flat and flexible sheet material mounted adjacent to and lying flat against said back support member, said position stop including a first part affixed to said bracket and a second part which may be flexed with respect to said first part, a stop member carried by and protruding away from said back support member, apertures in said second part of said position stop, said stop member being engaged with one of said apertures thereby locking said back support member in position, whereby said position stop may be flexed to a disengaged position in which said stop member is free from said apertures and said back support member may be moved within said bracket to another position in which said position stop may be allowed to return to engaged position in which said stop member engages another aperture.

4,102,550
MINING METHOD AND APPARATUS

John A. L. Campbell, Acton, and Daniel J. Moynihan, Chelmsford, both of Mass., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Apr. 20, 1976, Ser. No. 678,680
Int. Cl.[2] E21D *15/48*
U.S. Cl. 299—11 **5 Claims**



1. An apparatus for an ancillary support system, in combination, a mine roof chock

a flexible frame conveyor including means for suspending the frame thereof for movement along an overhead trackway,

means for supporting an elongate overhead track member on said chock, and means for releasably joining the ends of said overhead track member to ends of like members which, joined end-to-end, constitute serial parts of said overhead trackway,

said chock includng a roof beam

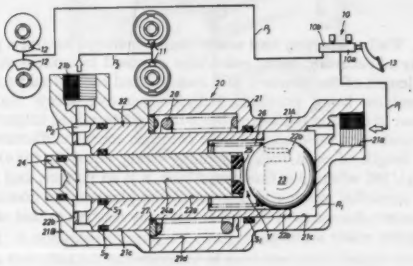
having a first portion thereof overlying vertically adjustable jack means and a second portion constituting an arm having a free end extending laterally outward in one direction from the first portion,

the means for supporting said overhead track member being mounted on said second portion, the means for supporting an overhead track member on said chock providing freedom of directional movement of said track member relative to said chock in vertical and horizontal planes.

4,102,551
FLUID PRESSURE CONTROL VALVE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 26, 1977, Ser. No. 800,860
Claims priority, application Japan, Jun. 5, 1976, 51-65980
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 A **11 Claims**



1. An inertia-controlled valve unit for incorporation in a vehicle braking system between a master cylinder and rear wheel brake cylinders, comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said rear wheel brake cylinders, and a stepped bore in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof;

a differential piston slidably disposed within said stepped bore to provide first and second fluid chambers respectively in open communication with said inlet and outlet ports, said piston being provided with an axial bore therethrough and being exposed at the smaller end thereof in said first chamber and at the larger end thereof in said second chamber;

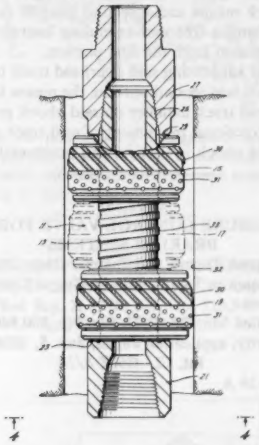
a tubular spool slidably disposed within said axial bore of said piston and having one end fixedly engaged with the inner wall of said housing in said second chamber and the other end exposed in said first chamber, said spool including an axial passage permitting fluid flow between said first and second chambers; and

a cut-off valve including a valve seat provided on the other end of said spool and an inertia-controlled ball located within said first chamber to co-operate with said valve seat and rolling toward said valve seat to cut-off fluid flow from said first chamber to said second chamber when said ball is subjected to a deceleration in excess of a predetermined value.

4,102,552
TANDEM ECCENTRIC ROLLER STABILIZER FOR EARTH BORING APPARATUS

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Sep. 7, 1976, Ser. No. 721,089
Int. Cl.[2] F16C 17/00, 19/00
U.S. Cl. 308—4 A 32 Claims

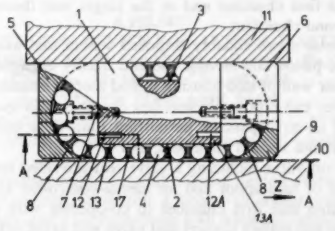


1. Wall contacting tool comprising a mandrel having a plurality of eccentric roller assemblies disposed in tandem along the length of the mandrel, said mandrel and each of said roller assemblies being provided with cooperative screw thread means to position the assemblies with predetermined azimuthal orientation of the planes of their common eccentric diameters, the length of each roller assembly being equal to $(p)(n) + (p)(x)/360$ where p is the thread lead, n is an integer, and x is the azimuthal spacing in degrees of the plane of the common eccentric diameters of the roller assembly relative to that of an adjacent roller assembly.

4,102,553
ROLLER BEARING FOR LONGITUDINALLY MOVABLE MACHINE ELEMENTS

Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschweski, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,933
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 7615699[U]
Int. Cl.[2] F16C 17/00
U.S. Cl. 308—6 C 10 Claims

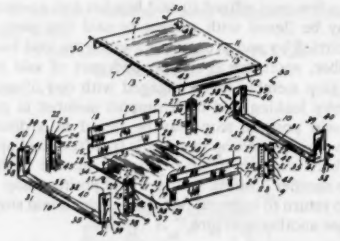


1. In a roller bearing for use between bearing surfaces of machine elements, the roller bearing including (a) a block having a top load surface and a bottom return surface and end and side surfaces adjacent said load surface, (b) a plurality of rollers distributed about said block along a continuous path which includes a load zone defined by said load surface and a first of said bearing surfaces, and (c) means for retaining said rollers in said path, said load surface having (i) length in the direction of movement of said rollers which extend transversely across said load surface, and (ii) running-in and running-out areas respectively where said rollers enter and leave said load zone, each roller having central and opposite end parts, and said running-in and running-out areas each having central and edge portions respectively underlying the central and end parts of said rollers, the improvement wherein said block has defined therein a first pair of generally symmetrical slots in the vicinity of at least one of said running-in and running-out areas, said slots extend along a plane generally parallel to said load surface and below said surface, each slot extends into said block lengthwise from one of said end surfaces and widthwise from an adjacent side surface with said slots being spaced apart in the width direction, the width of each slot is maximum at said end surface and diminishes to minimum at said adjacent side surface, whereby said slots generally underlie only said edge portions of the running-in and running-out areas, said edge portions are elastically yieldable, and loading on said rollers increases as they move through the running-in area and decreases as they move through the running-out area where said areas have said underlying slots.

4,102,554
INSTRUMENT CABINET

Richard C. Reimer, Oswego Township, Kendall County, Ill., assignor to Equipto Electronics Corporation, Aurora, Ill.

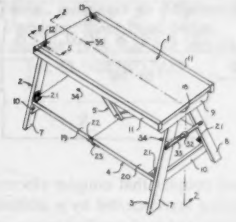
Filed Dec. 15, 1976, Ser. No. 750,827
Int. Cl.[2] B65D 7/00
U.S. Cl. 312—107 10 Claims



1. A sheet-material instrument cabinet providing an open-ended chamber receptive of an electronic panel or the like therein, the chamber being defined by top, opposite side and bottom walls, the cabinet comprising: a top member of generally U-shape cross section comprising a top panel having side flanges extending downwardly; a bottom member of generally U-shape cross section comprising a bottom panel having side flanges extending upwardly; a bottom member of generally U-shape cross section comprising a bottom panel having side flanges extending upwardly and disposed in cabinet side forming cooperation with said top member side flanges; said members together defining an open end for the cabinet; ribs along substantially the entire front-to-rear extent of the side walls to rigidify the side walls of the instrument cabinet; connector posts, which are also fastening surfaces for the intended panels, extending between corner areas of said top and bottom panels contiguous to said side flanges and with the opposite ends of the ribs providing locating means to assist in proper positioning of the connector posts relative to the opposite side walls, an end frame bezel cooperatively related to said members and said posts at said open end; means connecting said top and bottom members, said posts and said end frame bezel in unitary assembly; said ribs each having its opposite ends in direct abutting

engagement with said posts to further rigidify the side walls of cabinet and means adjacent to said one end for receiving instrument mounting means, wherein said ribs being shaped into the form of outwardly opening handle grooves and comprising chennel portions formed in the opposite side walls thereof.

4,102,555
FOLDING WORK TABLE APPARATUS
Thaddeus Tobolski, 731 N. 115th St., Wauwatosa, Wis. 53226
Filed Jan. 31, 1977, Ser. No. 763,864
Int. Cl.[2] A47B *3/00*; E04G *1/34*
U.S. Cl. 312—240 **8 Claims**



1. A folding work table apparatus comprising a pair of laterally spaced first and second vertical leg assemblies having laterally spaced supporting leg members, a rectangular top work table abutting the top of the leg assemblies in a supported work position, said table and leg assemblies having a similar length, a hinge means connected to said table and to said first leg assembly for pivotal movement of said table through 270° from said work position to a storage position abutting the exterior of said first leg assembly, an intermediate shelf structure having a first flat shelf element and a second flat shelf element, first and second hinge means fixedly connected one each to each of said first and second shelf elements and said first and second leg assemblies and having a releasable center connection means firmly supporting the elements in generally coplanar relation and including a movable element to release the connection means for permitting folding of the shelf elements into abutting engagement with the leg members of the leg assemblies, and a pair of stabilizing members one for each of said first and second elements, each member connected to the one of the leg assemblies immediately adjacent the element and to one of the elements of the intermediate shelf structure for firmly supporting the elements, said stabilizing members including release means for permitting said folding of the intermediate shelf structure and positioning of the leg assemblies into an adjacent storage relationship with the shelf elements located between the leg members.

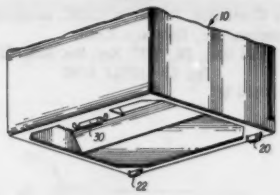
4,102,556
REAR SUPPORT STRUCTURE FOR A CABINET
William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Jan. 3, 1977, Ser. No. 756,236
Int. Cl.[2] F16M *11/24*
U.S. Cl. 312—250 **12 Claims**

1. A structure for supporting a cabinet on a supporting surface comprising:

(a) a first member positioned on said cabinet and extending transversely of said cabinet;

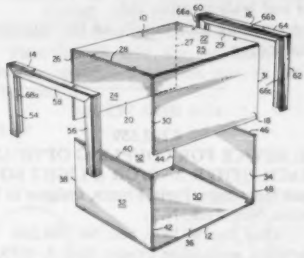
(b) an elongated member having an axial passage therein, said elongated member being mounted on said first member and being rotatable on said first member to facilitate movement of said cabinet; and

(c) a surface on said elongated member within said passage engaging a surface of said first member, one of said surfaces being of arcuate shape lengthwise of said elongated member to permit tilting of said elongated member relative to said first member, whereby said elongated member



is caused to engage the supporting surface along the entire length of said elongated member.

4,102,557
COLLAPSIBLE CONTAINER
Walter Lee, Springfield, Va., and Kenneth C. Litt, Silver Spring, Md., assignors to Pace Incorporated, Silver Spring, Md.
Filed Mar. 1, 1977, Ser. No. 773,290
Int. Cl.[2] B65D *7/00*; A47B *43/00*
U.S. Cl. 312—257 R **3 Claims**



1. A collapsible container comprising

a first channel-like member of predetermined length having open ends, two side members and an intermediate member of predetermined width extending between the two side members, said first channel-like member having first and second U-shaped edges respectively defined by the open ends of the channel-like member;

a second channel-like member having two side members with edges and an intermediate member extending between the two side members, said second channel-like member having a first and second U-shaped edges defined by the respective edges of the two side members, the length of said second channel-like member being approximately the same as the said predetermined width of the intermediate member of said first channel-like member and the width of the intermediate member of said second channel-like member being approximately the same as that of said predetermined length of the first channel-like member; and

first and second U-shaped members, each member having a first groove extending around the inner periphery thereof and a second groove perpendicularly oriented with respect to said first groove and extending around the member,

said first and second U-shaped edges of said first channel-like member being respectively disposed in the first grooves of said first and second U-shaped members and

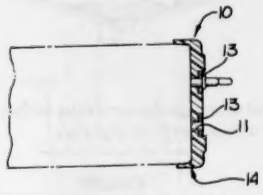
said first and second U-shaped edges of said second channel-like member being respectively disposed in the second grooves of said first and second U-shaped members.

4,102,558

NON-SHOCKING PIN FOR FLUORESCENT TYPE TUBES

Howard Ellis Krachman, Pasadena, Calif., assignor to Developmental Sciences, Inc., Industry, Calif.

Filed Aug. 29, 1977, Ser. No. 828,772
Int. Cl.² H01J 5/50
U.S. Cl. 339—144 R **12 Claims**



1. The terminal pin of electrically conducting material for use with end caps of fluorescent discharge tubes and the like comprising:

an elongated pin body portion;

a tip portion extending from an end of said body portion, said tip portion having a reduced thickness with respect to that of said body portion; and

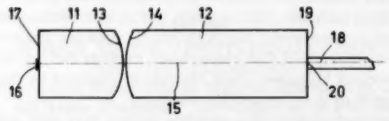
insulation covering substantially all the exterior surface of said tip portion.

4,102,559

OPTICAL DEVICE FOR COUPLING OPTICAL FIBERS TO EACH OTHER AND/OR A LIGHT SOURCE

Jean-Jacques Hunzinger, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,559
Claims priority, application France, Dec. 9, 1975, 75 37543
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.18 **11 Claims**



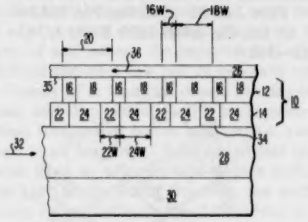
1. An optical device for coupling a source of radiation energy to an optical fiber, comprising in the direction of propagation of light, a first thick plano-convex lens, a thick second plano-convex lens, said two lenses having their convex sides facing and substantially in contact with each other and their axes coinciding with that of a fiber at the fiber input, a source of light energy disposed substantially perpendicular to the lens axis in the immediate vicinity of the center of the plane surface of the first lens and the input end-face of the fiber in the immediate vicinity of the center of the plane surface of said second lens, the radii of curvature of the dioptric faces of the two lenses, their diameters, their thicknesses and the refractive indexes of their constituent materials being such that the system formed by the two lenses optically conjugates the source to the input end-face of the fiber, the diameter of the image of the source being substantially equal to the diameter of the fiber, the image aperture angle being at least equal to half the acceptance angle of the fiber, and the ratio of the radii of the convex dioptric surfaces being such that the spherical aberration is minimal for the selected magnification and the refractive indexes of the materials of the lenses.

4,102,560

OPTICAL COUPLER

Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 675,260, Apr. 8, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,171
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.19 **3 Claims**



1. An optical coupler that couples electromagnetic energy between a guiding layer carried by a substrate and a medium, said guiding layer and said medium being adapted to alternatively receive an input beam of electromagnetic energy, comprising:

a first diffraction grating; and

a second diffraction grating having a surface contiguously connected to a surface of said first grating, said gratings being disposed intermediate said guiding layer and said medium, said first grating causing a diffraction of evanescent waves that emanate therefrom in response to said input beam to provide diffracted electromagnetic energy that is coupled between said guiding layer and said medium, said first grating having a diffraction strength that causes a coupling to said substrate of a first component of an electromagnetic field having a given amplitude and a given phase, said second grating causing a diffraction of evanescent waves of electromagentic energy to provide diffracted electromagnetic energy that is coupled between said guiding layer and said medium, said second grating having a diffraction strength that causes a coupling to said substrate of a second component of said field having an amplitude substantially equal to said given amplitude and a phase substantially opposite from said given phase whereby said field is suppressed.

4,102,561

OPTICAL WAVEGUIDE CONNECTOR

Robert M. Hawk, Bath, and Frank L. Thiel, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 2, 1975, Ser. No. 592,362
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.21 **10 Claims**

1. An optical fiber connector comprising

means defining an elongated aperture for receiving the end portions of a pair of fibers to be connected,

means disposed remote from the endface of at least one of said fibers for tightly clamping said fiber,

means disposed between said means for tightly clamping said

fiber and said aperture defining means for loosely clamping said fiber, and

a region disposed between said means for tightly clamping said fiber and said means for loosely clamping said fiber wherein said fiber is bowed, the tendency of said fiber to straighten providing a force which urges the endface thereof to bear against the endface of the other of said fibers.

4,102,562

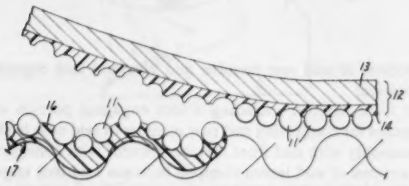
RETROREFLECTIVE TRANSFER SHEET MATERIAL

James H. Harper, North Saint Paul, and Linda S. Smith, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 14, 1976, Ser. No. 695,974

Int. Cl.[2] G02B *5/128*

U.S. Cl. 350—105 **12 Claims**



9. Transfer sheet material for forming retroreflective graphic images on a substrate, said sheet material comprising a support sheet that includes a dimensionally stable base sheet and a heat-softenable exterior layer, a dense continuous monolayer of transparent microspheres averaging less than about 150 micrometers in diameter and partially and removably embedded in the heat-softenable layer to a depth averaging between about one-quarter and one-half of their diameters, a transparent dielectric mirror coated over the surfaces of the microspheres that are exposed above the heat-softenable layer, a clear thin adhesion-promoting layer coated over the dielectric mirror, and a transfer layer of heat-softenable fabric-penetrating vinyl plastisol ink printed over the layer of microspheres in an imagewise pattern which leaves areas of the layer of microspheres unprinted, the thickness of the transfer layer being at least 40 micrometers and sufficient to embed within the transfer layer the surfaces of the microspheres that are exposed above the support sheet in the printed areas; whereupon when the transfer layer is adhered to a fabric and the support sheet stripped away, the microspheres are pulled from the support sheet to form an image that is retroreflective over its full area.

4,102,563

EYE FUNDUS CAMERA FREE FROM UNDESIRED REFLECTED AND DIFFUSED LIGHT BEAMS

Isao Matsumura, Yokohama; Takeshi Kuwayama, Atsugi, and Yoshimi Kohayakawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,809

Claims priority, application Japan, Dec. 1, 1975, 50-143729

Int. Cl.[2] A61B *3/10*

U.S. Cl. 351—7 **6 Claims**

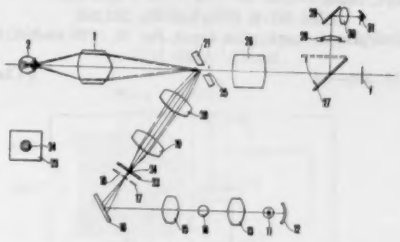
1. An eye fundus camera free from undesired reflected and diffused light beams comprising:

a photographing optical system for photographing the fundus of an eye to be inspected and being provided with a photographing aperture;

an illuminating optical system for illuminating the fundus of the eye to be inspected through a ring-shaped aperture;

a first optical means in said illuminating optical system for forming an image of the ring-shaped aperture in the iris of the eye to be inspected;

a second optical means in said photographing optical system



for conjugating the photographing aperture with the cornea of the eye to be inspected so as to eliminate diffused and reflected light beams from the cornea of the eye to be inspected.

4,102,564

PORTABLE DEVICE FOR THE ACCURATE MEASUREMENT OF EYE MOVEMENTS BOTH IN LIGHT AND OBSCURITY

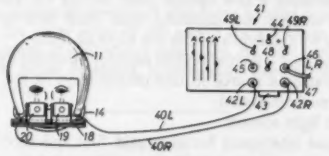
Henry L. Michael, 265 Riverside Dr., New York, N.Y. 10025

Filed Feb. 20, 1976, Ser. No. 660,030

Claims priority, application Belgium, Apr. 18, 1975, 828128; Feb. 10, 1976, 164219

Int. Cl.[2] A61B *3/14*

U.S. Cl. 351—7 **9 Claims**



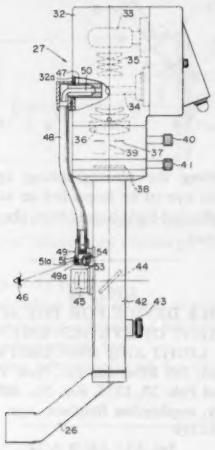
1. A device for measurement of movements of an eye of a subject comprising support means for engaging the head of a subject in fixed relation therewith, a housing mounted on said support means at a fixed distance from the eye of the subject, two non-modulated infra-red light sources in said housing positioned to direct infra-red beams of light onto the eye of the subject, two sensing means in said housing equally spaced from said sources along a straight line therewith for receiving infra-red light reflected from said eye by the corresponding sources, said sensing means and said light sources being in fixed relationship in said housing, each of said sensing means including an infra-red light filter to pass substantially only infra-red light, said housing having an opening located in the center of the line joining the sources and the sensing means and through which opening a beam of visible light can be directed towards the subject to permit the irradiating infra-red light to correctly fall upon the eye before commencing an operation, means for selectively interrupting said visible light, means for calibrating said housing on said support means for controlling the positioning of said beams from said sources to the eye and thereby the reflected beams from said eye, and non-modulated electronic means connected to said sensing means for producing an output signal, said calibrating means permitting lateral sliding movement of said housing along an axis parallel to said line joining the sources and sensing means and pivotal movement of said housing along an axis parallel to said line.

4,102,565

SLIT LAMP MICROSCOPE

Shiro Takizawa, Tokyo, and Shinichi Nishimura, Ageo, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1976, Ser. No. 703,547
Claims priority, application Japan, Jul. 10, 1975, 50-96021[U]
Int. Cl.[2] A61B 3/10
U.S. Cl. 351—14 5 Claims



1. A slit lamp microscope comprising:
a first light source;
means defining a first optical path, having slit means disposed therein, for directing light from said first light source to a patient's eye in the form of a slit;
means defining a second optical path for directing light from said first light source to said patient's eye in the form of uniform illumination;
a second light source;
lens means interposed between said first and second light sources for directing light from said second light source along said first optical path;
said second light source being disposed relative to said first light source such that the second light source does not interfere with the transmission of said light from said first light source along either of said first or second optical paths; and
optical means defining a microscope for investigating said patient's eye.

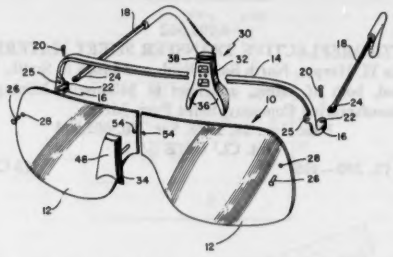
4,102,566

RIMLESS SPECTACLE

Robert N. Shelton, Leominster, Mass., assignor to Foster Grant Corporation, Leominster, Mass.

Filed May 2, 1977, Ser. No. 792,622
Int. Cl.[2] G02C 1/04, 5/02
U.S. Cl. 351—131 7 Claims

1. A rimless spectacle assembly comprising:
a pair of lenses residing in contiguous edgewise relation for a distance downwardly from the top contour edges of the lenses at the central bridge area of said assembly;
a brow bar extending across the width of said spectacle assembly along the upper edge of said pair of lenses, said brow bar bending downwardly at each end thereof along the side edges of each of said lenses and including portions of said brow bar to which said lenses are connected to near each end thereof and a pair of hinge portions extending rearwardly from the extreme opposite end portions of said brow bar;
a pair of temples pivotly connected to said hinge portions at each end of said brow bar;
a nose bridge assembly consisting of a rear member and a front member;
said rear member including a connecting portion at the upper end thereof engaging said brow bar, a pair of nose engaging pad members extending finger-like from the



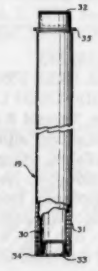
bottom of said rear member and a central lens engaging portion;
said front member including a lens engaging portion and means for connecting said rear member of said nose bridge assembly with said front member thereof with contiguous portions of said lenses clamped between said lens engaging portions of said front and rear members of said nose bridge assembly.

4,102,567

MATERIAL FOR FABRICATION OF ARTIFICIAL INTRAOCULAR LENSES AND HARD CONTACT LENSES

Patricia M. Cuffe, Dudley; Albert R. LeBoeuf, Sturbridge, and Edward A. Travnicek, Southbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 13, 1976, Ser. No. 722,961
Int. Cl.[2] B32B 27/30, 27/36; G02C 7/04
U.S. Cl. 351—160 4 Claims



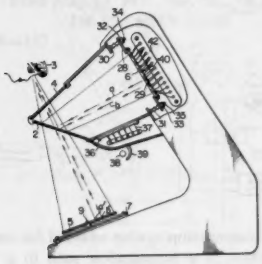
1. A thin hard optical lens of polymethylmethacrylate material of at least 99% polymethylmethacrylate characterized by good machinability, color uniformity, and optical quality, said material being characterized by having an average molecular weight of at least one million and substantial freedom from strain and free from warpage.

4,102,568

APPARATUS FOR INDICATING MOUNTING POSITIONS OF COMPONENTS

Kiyoshi Miyagi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1975, Ser. No. 641,184
Claims priority, application Japan, Dec. 18, 1974, 49/145932
Int. Cl.[2] G03B *21/28;* H01R *43/00*
U.S. Cl. 353—28 4 Claims



1. Apparatus for indicating the positions on a printed base at which components such as transistors and resistors are to be mounted, comprising:

a half mirror spaced from said printed base,

component mounting position indicating means comprising a base containing a plurality of apertures at positions therein corresponding to positions on said printed base at which said components are to be mounted, said component mounting position indicating means being located adjacent said half mirror, said half mirror being positioned such that an operator, when viewing said half mirror, sees therein said printed base and superimposed thereon said component mounting position indicating means,

a light source means,

a plurality of light conductors mounted one each in said apertures,

means for adjusting the relative positions of said printed base and said component mounting position indicating means with respect to each other so that said printed base and said component mounting position indicating means optically conform with each other when viewed through said half mirror,

a plurality of component compartments,

means for exposing a selected one of said compartments at a time to provide access thereto,

means for selectively controlling the illumination of said light conductors by said light source means to thereby illuminate the position on said component mounting position indicating means corresponding to the position on said printed base where a selected component is to be mounted, said means for selectively controlling being coupled to and in interlocking relation with said means for exposing to provide access to the compartment holding said selected component, and

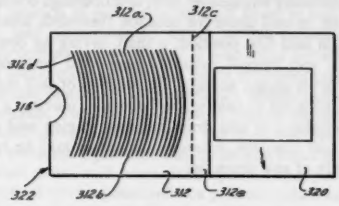
a guide plate located adjacent said component mounting position indicating means containing other light conductors mounted therein, said other light conductors being selectively illuminated by said light source means in accordance with said means for selectively controlling, said guide plate providing instructions for mounting said selected component and being visible simultaneously with said superimposed image of said printed base and component mounting position indicating means.

4,102,569

SOUND SLIDE

Morris Schwartz, Plainville, Conn., assignor to Kalart Victor Corporation, Plainville, Conn.

Filed Sep. 7, 1976, Ser. No. 720,951
Int. Cl.[2] G03B *21/02, 31/06*
U.S. Cl. 353—120 2 Claims



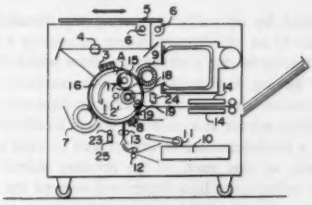
1. A sound slide assembly for a sound slide projector having a sound head movable along a circularly curved path, said assembly comprising: a substantially rectangular plate-shaped single frame body made of rigid material, said body incorporating an image-bearing section and a magnetic sound track section, said two sections being permanently joined to each other along a common edge, said image-bearing section including four side portions defining one opening adapted to receive and maintain in fixed position a photographic transparency, one of said side portions having a crosswise width larger than the other side portions, said one side portion constituting a support base for said sound track section, said support base being covered on its opposite surfaces with magnetic recording material for receiving on said material on each of said surfaces a sound track, each of said sound tracks including a series of spaced, uniformly long tracks which are arcuate in shape and consist of segments of circles all centers of which are located at points at or beyond the outer edge of the sound track section of said widened portion of said sound side body, the line connecting said centers, when extended, substantially bisects the image bearing section.

4,102,570

TRANSFER TYPE COPIER

Kazuho Shimoda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 506,203, Sep. 16, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,362
Claims priority, application Japan, Sep. 19, 1973, 48-104873
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—16 3 Claims



1. In a transfer type copier of the type having a drum rotatably mounted between a pair of side panels, and a long web of photosensitive medium mounted on supply and take-up reels within said drum in which a portion of the web is adapted to be carried on part of the peripheral surface of the drum, and means for advancing said web to move said portion back into said drum and to replace said portion with an unused portion of said web, the improvement comprising a drum lid normally engageable with the peripheral surface of said drum and form-

ing that part of the peripheral surface of said drum which does not support said web, and in which said drum lid is movable between a first position in which said lid is connected to and rotatable with said drum and a second position in which said lid is lifted and disconnected from said drum body and not rotatable therewith, in combination with a pair of projections integral with and extending outwardly from opposite ends of said drum and each having an opening therethrough, a pair of extensions normally engageable with said openings connecting said drum lid to said drum for rotation therewith when said drum lid is in said first position, a shaft having an operating knob at one end thereof rotatably supported between said panels, and lever means actuated by rotation of said shaft for lifting said drum lid to said second position, moving it away from the periphery of said drum and disengaging said extensions from said openings, whereby said drum may be rotated independently of said drum lid.

4,102,571

METHOD FOR OPTICALLY MEASURING A DISTANCE

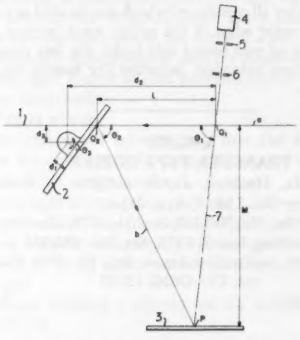
Mamoru Hayamizu, and Yasushi Tanigaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,429

Claims priority, application Japan, Oct. 31, 1975, 50-131788

Int. Cl.[2] G01C *3/00, 3/08*

U.S. Cl. 356—1 **4 Claims**



1. A method for optically measuring the distance from a reference axis to an object comprising: providing a rotatable polyhedron mirror having a rotary axis about which the mirror rotates and having a plurality of mirror surfaces disposed different distances from said rotary axis; continuously rotating said polyhedron mirror at a constant speed; irradiating a light beam along a predetermined reference axis toward said polyhedron mirror so that each of the rotating mirror surfaces successively reflects the light beam and sweeps the reflected light beam in a line over the object to develop a train of reflected light pulses; and successively detecting by a photodetector the reflected light pulses reflected from a predetermined spot along the swept line and determining the rotary angles of said mirror at the instant of the reflected light detection by said photo-detector, whereby the distance between said spot and said predetermined reference axis can be calculated with the rotary angles of said mirror and with the distances of said mirror surfaces from said rotary axis of the polyhedron mirror.

4,102,572

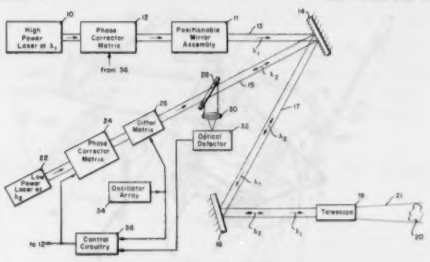
DUAL-WAVELENGTH COHERENT OPTICAL ADAPTIVE SYSTEMS

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 11, 1977, Ser. No. 823,815

Int. Cl.[2] G01C *3/08;* **H01S** *3/00*

U.S. Cl. 356—5 **15 Claims**



1. An energy transmission system adapted for compensating for phase distortion in a propagation path to a target, said system comprising:

means for producing a first energy beam of a first wavelength;

means for directing said first energy beam along a first path to the target;

adaptive subsystem means, responsive to energy at a second wavelength returned to the system from the target along a path substantially identical to at least the portion of said first path between the target and the system, for continuously mesuring the phase distortion in said return path and for producing control signals indicative of said measured values; and

phase corrector matrix means disposed in the path of said first beam and responsive to said control signals for adjusting the relative phase across said first beam so as to compensate for the measured phase distortion;

whereby the energy across said first beam at the target is caused to approach an in-phase condition.

4,102,573

ELECTRODE FOR A SPECTRO-ANALYTICAL ARRANGEMENT

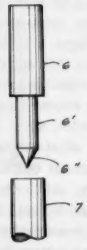
Wilhelm Berstermann, Georgsmarienhutte, Fed. Rep. of Germany, assignor to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,796

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607596

Int. Cl.[2] G01J *3/30*

U.S. Cl. 356—86 **10 Claims**



1. In an arrangement for spectro-analytically determining the compositions of the materials of metallic bodies using an

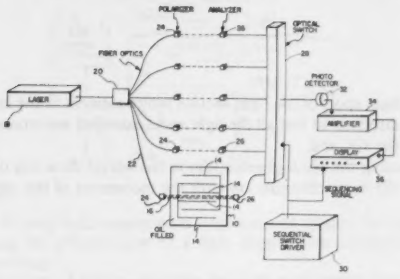
electric spark discharge between an electrode and a respective metallic body, the improvement wherein the electrode is of a substance consisting of carbonaceous and metallic components.

4,102,574

METHOD AND MEANS OF MONITORING THE QUALITY OF A FLUID DIELECTRIC

Herman H. Wieder, and Neil M. Davis, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,690
Int. Cl.[2] G01N *21/40*
U.S. Cl. 356—117 **7 Claims**



4. Apparatus for monitoring the quality of a fluid dielectric of a capacitor comprising:

(a) a capacitor having a case filled with dielectric fluid and the capacitor plates submerged in said fluid, opposite walls of said case having apertures in alignment with each other,

(b) a source of high intensity light and a first polarizer positioned adjacent one of said apertures for emitting a plane-polarized high intensity light beam through one of said apertures between two of the plates of said capacitor and through the other aperture,

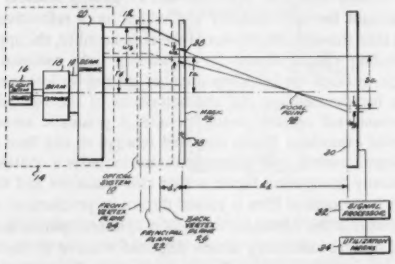
(c) a second polarizer and a light detecting means positioned to detect the amount of said light beam that passes through said dielectric field.

4,102,575

BACK VERTEX ANNULAR APERTURE

Edward F. Lapornik, Washington, D.C., and Douglas D. Rife, Herndon, Va., assignors to Acuity Systems, Incorporated, S. Reston, Va.

Filed Mar. 28, 1977, Ser. No. 782,297
Int. Cl.[2] G01B *9/00*
U.S. Cl. 356—125 **7 Claims**



1. In an apparatus for measuring refractive properties of a sphero-cylindrical optical system having a vertex and a focal point, said apparatus being of the type including a light source for providing a collimated beam of light of predetermined beamwidth in a predetermined direction, means for positioning said optical system in the path of said beam of light, means for effecting a relative rotation between said light beam and said optical system about an axis parallel to said predetermined direction such that said light beam effectively scans said optical system, to produce a refracted light beam, said refracted light beam tending to illuminate a portion of a subsequent plane parallel to said optical system plane; photodetector means for generating a signal indicative of the instantaneous meridional radial position of said refracted light beam in said subsequent plane, said photodetector signal having predetermined frequency components indicative of respective refractive properties of said optical system; and signal processor means, responsive to said plurality of photodetector output signal frequency components, for generating output signals indicative of said respective refractive properties, the improvement wherein:

said refracted light beam moves about a locus in an intermediate plane, said intermediate plane being parallel to said optical system plane and at a predetermined axial distance from said vertex; and said apparatus further comprises:

means including an annular aperture therein for admitting to said subsequent plane only such portion of said light beam as passes through said aperture, said aperture having a predetermined radius and radial width, and being disposed within said locus at said intermediate plane, said radial width being less than the radial width of said locus, whereby deviations in said refracted beam radial position from said predetermined radius are representative of the spherical power of said lens in the instantaneous meridian scanned;

said aperture including a predetermined number of supportive members connecting said inner and outer edges, said supportive members generating spurious frequency components in said photodetector output signal at frequencies other than said predetermined frequency components; and wherein

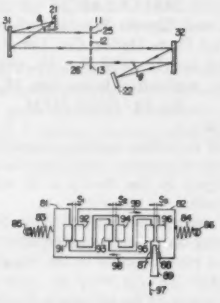
said signal processor means includes means for discriminating between said predetermined frequency components and said spurious frequency components.

4,102,576

MONOCHROMATOR COMBINING A PLURALITY OF LIGHT DISPERSING ELEMENTS

Yoshio Maeda; Koichi Matsumoto, both of Katsuta, and Kenji Fukuda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,636
Claims priority, application Japan, Oct. 27, 1975, 50/129023
Int. Cl.[2] G01J *3/12*
U.S. Cl. 356—101 **12 Claims**



1. A monochromator combining a plurality of light dispersing elements, comprising $(n + 1)$ slits, n light dispersing elements and a plurality of optical collimating elements, n being a natural number, wherein an entrance slit, a first light dispersing element, a first intermediate slit, . . . , an n-th light dispersing

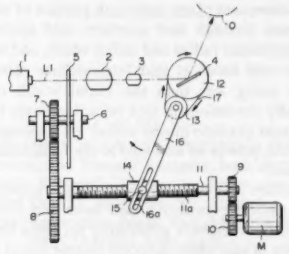
element and an exit slit are successively arranged in a travelling direction of light along its optical path with one of the first and the *n*-th light dispersing element being formed of a prism and each of the other light dispersing elements or another element being formed of a diffraction grating, and the width of the slit disposed adjacent to said prism at the end of the optical path in the monochromator being made greater by a predetermined width than the width of an intermediate slit disposed adjacent to said prism, said predetermined width being not smaller than a deviation of light having a required wavelength resulting from either rotational errors or variation of refractive index of the prism due to variation of temperature.

4,102,577

METHOD OF FORMING MOIRE CONTOUR LINES

Masane Suzuki, and Kiyoshi Suzuki, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jan. 4, 1977, Ser. No. 755,728
Int. Cl.[2] G01B *11/24*
U.S. Cl. 356—169 **4 Claims**



1. A method of forming a moire contour line pattern representing the surface configuration of a three-dimensional object comprising the steps of:

generating a light beam,

periodically chopping the light beam at a given frequency,

converting said light beam into a plane of light directed to an object,

causing said plane of light to scan in the direction normal to itself as said chopping proceeds thereby forming, in result, an image of a grating on the object, and

superposing said image of the grating with a standard grating to form a moire pattern which represents the surface configuration of said object.

4,102,578

METHOD OF AND APPARATUS FOR RECORDING SURFACE IRREGULARITY OF OBJECT

Masane Suzuki, and Kiyoshi Suzuki, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jan. 13, 1976, Ser. No. 648,814
Claims priority, application Japan, Jan. 15, 1975, 50-6780
Int. Cl.[2] G01B *11/24*
U.S. Cl. 356—120 **7 Claims**

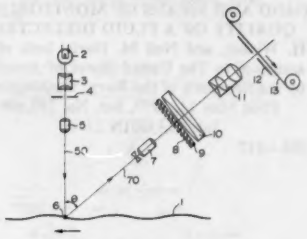
1. A method of recording surface irregularities of a moving object in the form of contour lines comprising the steps of:

feeding an object in the direction in which the surface thereof extends,

forming a slit image on the surface of the object by means of a first focusing optical system, said slit image extending in the direction perpendicular to the direction in which the object is fed,

projecting an image of the slit image formed on the surface of the object onto a grid by means of a second focusing optical system having an optical axis inclined at an angle with respect to the optical axis of the first focusing optical system to form a light section moire element consisting of a number of light spots arranged at intervals representing the surface irregularities of the object, the grid being oriented in the position in which respective slits forming the grid are in parallel to the direction of said slit image,

forming an image of the light section moire element on a slit located upon a photographic film through a condenser lens and an anamorphic lens which extends the respective



light spots of the light section moire element in the lateral direction so that all the light spots extended are crossed by the slit, and

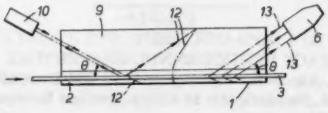
feeding the photographic film in the lateral direction of the slit in synchronization with the movement of the object.

4,102,579

OPTICAL APPARATUS

William James Stewart, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 6, 1975, Ser. No. 629,608
Claims priority, application United Kingdom, Nov. 8, 1974, 48337/74
Int. Cl.[2] G02B *27/00*
U.S. Cl. 356—201 **12 Claims**

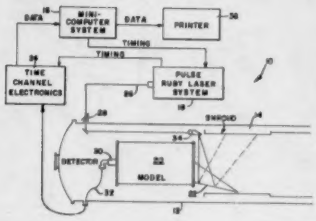


1. An optical apparatus for use in association with an optical fibre having a core member whose cross-sectional boundaries are formed from a set of curves and a cladding member which surrounds the core member and which has a refractive index less than the refractive index of the core member, the apparatus including optical means for examining light radiated at an angle through the cladding member caused by leakage radiation for determining the characteristics of the optical fibre, wherein said optical means includes a prismatic means and optical examining means disposed relative to one face of said prismatic means, said prismatic means includes a container, an optically transparent liquid within said container and through which the optical fibre is passed during its production, at least one wall of the container being of a light transparent material; said optical examining means disposed relative to the said at least one transparent wall of the container for examining the light radiated at an angle through the cladding member; and means adapted to maintain the optical fibre in a parallel relationship with the said at least one transparent wall of the container.

4,102,580
SYSTEM FOR THE MEASUREMENT OF ULTRA-LOW STRAY LIGHT LEVELS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles L. Wyman; Donald B. Griner; William A. Hurd; Glenn B. Shelton; Gary H. Hunt, all of Huntsville, Ala.; Bill B. Fannin; Robert P. Brealt, both of Tucson, Ariz., and Charles A. Hawkins, Arab, Ala.

Filed Dec. 29, 1976, Ser. No. 755,323
Int. Cl.[2] G01N *21/48;* G01B *9/00*
U.S. Cl. 356—210 17 Claims



1. A stray light suppression measurement system for determining the effectiveness of a light suppression arrangement comprising:

a vacuum chamber enclosing the light suppression arrangement;

light generating means for producing a short-pulsed high power light beam illuminating a portion of the light suppression arrangement;

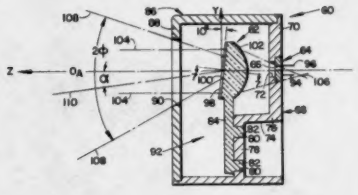
detector means provided within the light suppression arrangement for sensing the light reflected onto the image plane of the arrangement, said detector means producing an analog signal; and

time discrimination electronic means connected to said detector means and triggered by the firing of said light generating means for producing a plurality of sample signals into which said analog signal produced by said detector means is loaded thereby producing a time discriminating signal.

4,102,581
UNICELL PHOTOELECTRIC PHOTOMETER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1977, Ser. No. 782,993
Int. Cl.[2] G01J *1/42;* H01J *3/14*
U.S. Cl. 356—225 16 Claims



1. A photometer of the photoelectric type for use in photographic apparatus, said photometer comprising:

a photosensitive transducer having a photosensitive surface of predetermined dimensions, said transducer operating to provide an output response which varies in correspondence with the amount of radiant power incident on said photosensitive surface;

optical means disposed about an optical axis which ultimately intersects said photosensitive surface of said transducer, for optically cooperating with said predetermined dimensions of said photosensitive surface to define a field of view for said photometer, said optical means including:

(a) a first surface through which scene radiation emerges from said optical means, said first surface being configured to converge said radiation emerging from said optical means toward said optical axis onto said transducer, said transducer and said first surface of said optical means, in combination, defining a specific acceptance angle which is substantially rotationally symmetric about said optical axis, and

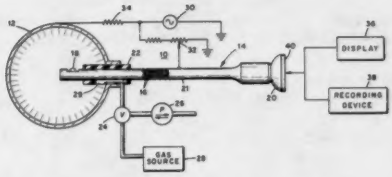
(b) a second surface positioned to receive radiation from said field of view of said photometer and to introduce said radiation into said optical means, said second surface configured to provide the photometer with specific acceptance angles which are substantially the same as the specific acceptance angle defined by said transducer and said first surface of said optical means, in combination, in one plane while being substantially greater than the specific acceptance angle defined by said transducer and said first surface of said optical means, in combination, in a plane substantially orthogonal to said first plane; and

means for stationing said transducer and said optical means in substantially light tight, spaced apart relation with respect to each other.

4,102,582
EXAMINATION OF INTERIOR SURFACES USING GLOW-DISCHARGE ILLUMINATION

David E. Lord; Richard R. Petrini, and Gary W. Carter, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1976, Ser. No. 740,338
Int. Cl.[2] G01N *21/16*
U.S. Cl. 356—241 22 Claims



1. A method for examining the interior surfaces of a hollow structure including the steps of:

filling the interior of the hollow structure with an ionizable gas;

ionizing the gas to produce a glow discharge in the gas to illuminate the interior surfaces of the structure; and

examining the glow discharge illuminated surfaces of the structure with a viewing means including a portion positioned within the structure.

4,102,583
PROFILE CUTTER

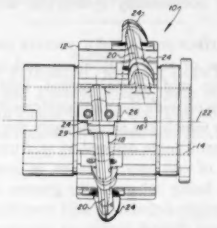
Arvid L. Nelson, Quincy, Ill., assignor to Gardner-Denver Company, Dallas, Tex.

Filed Mar. 28, 1977, Ser. No. 781,614
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—25 12 Claims

1. A rotary cutter for use in cutting one or more helical flutes of a predetermined form profile on a generally cylindrical workpiece wherein the workpiece and the cutter are simultaneously rotated about their respective central axes of rotation, said cutter comprising:

a generally cylindrical cutter body having a longitudinal central axis of rotation; and

a plurality of cutting blades mounted on said body spaced apart, one blade from the other, with respect to the circumference of said body, said blades being arranged along a helical line with respect to said axis of rotation of said body wherein substantially only one turn of the helix is formed, said blades are spaced apart such that none of the blades are axially aligned with any other blade; and



each blade has a cutting edge the contour of which is different from the cutting edge contour of every other blade and is characterized by a series of points each of which at a particular angular position of said blade with respect to the axis of rotation of said cutter corresponds to the position of a point on the profile of said flute with respect to the axis of rotation of said cutter whereby all points on the profile of said one or more flutes will be cut by each blade of said cutter.

4,102,584

CAPILLARY TUBE PEN POINT

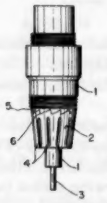
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Dec. 7, 1976, Ser. No. 748,606

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557705; Dec. 20, 1975, 7540761

Int. Cl.[2] B43K *1/06*

U.S. Cl. 401—259 **6 Claims**



1. In a capillary writing pen of the type having a cylindrical body portion with an open end a writing pen tip with reservoir and a cartridge shell which is fitted within the cylindrical body such a that a rearward surface of the cartridge shell and the open end of the cylinderical body axially abut each other, while the pen tip extends axially thereof for writing purposes, the improvement comprising:

A. Complemental wave-like surfaces formed in the abutting open end of the cylindrical body and the rearward surface of the cartridge shell such that lateral twisting of said cartridge shell with respect to said cylindrical body results in axial separation of said cartridge shell with respect to said cylindrical body.

4,102,585

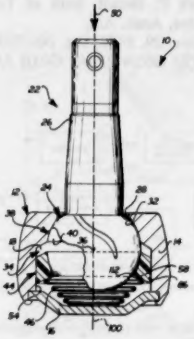
BALL JOINT

Edward John Herbenar, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 16, 1977, Ser. No. 807,113

Int. Cl.[2] F16C *11/00*; F16D *1/12*

U.S. Cl. 403—138 **15 Claims**



1. A pivot joint comprising a housing defining a socket chamber having a side surface, a ball stud having a head portion disposed in said socket chamber and a shank portion to which axial load forces are applied, bearing means disposed in said socket chamber for supporting said head portion of said ball stud, said bearing means includng a bearing seat having an inner surface area which is disposed in abutting engagement with said head portion of said ball stud and an outer surface area which is disposed in abutting engagement with the side surface of said socket chamber, and means for retaining said bearing seat against movement relative to the side surface of said socket chamber under the influence of axial load forces applied to said shank portion of side ball stud, said means for retaining said bearing seat against movement including means for applying to said bearing seat a static friction force equal to the axial load force applied to said shank portion of said ball stud.

4,102,586

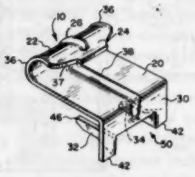
SPRING FASTENER CLIPS FOR WOODEN FURNITURE RAILS

Kenneth Carlton Pearson, Glenview, and Harrison Church Lingle, Northbrook, both of Ill., assignors to Hartco Company, Lincolnwood, Ill.

Filed Jun. 27, 1977, Ser. No. 810,202

Int. Cl.[2] F16F *3/02*

U.S. Cl. 403—188 **11 Claims**



1. A self-supporting integral sheet metal clip for securing one end of an upholstery spring to the horizontally grained wooden rail of an article of furniture, said clip being formed from an elongated generally rectangular flat blank of sheet metal stock and comprising: a stamping including a flat horizontal base portion designed for positioning on the top surface of the rail and adapted to support said end of the spring, the outer end of said base portion being provided with a down-

turned leg designed for face-to-face engagement with the outer side of the rail, the lower edge of said downturned leg being formed with a downwardly opening three-sided recess therein having spaced apart side edges of equal extent and which, when the clip is in position on the rail, traverse the wood grain of the rail at a relatively steep angle, the upper edge of recess extending horizontally, and an anchor prong projecting laterally at a right angle to the plane of the leg from each of said side edges and adapted to penetrate the wood of the rail when the leg is forced toward the latter, said side edges constituting fold lines along which the anchor prongs are bent laterally out of the plane of the blank, said anchor prongs being equal in extent to the width of the recess so that in the flat blank they overlap each other and substantially fill the space between the fold lines whereby, when the prongs are folded out of the blank, one prong assumes an elevation which is higher than the elevation of the other prong to the end that the prongs will penetrate the wood of the rail at different elevations.

4,102,587

ANGLE-SHAPED SUPPORT MEMBER

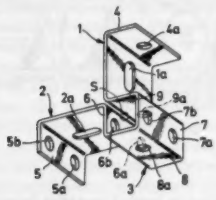
Armin Herb, Peissenberg; Erich Leibhard, and Raimer Uhlig, both of Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 18, 1977, Ser. No. 797,922

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623476

Int. Cl.[2] F16B 9/00

U.S. Cl. 403—205 **16 Claims**



1. In an angle-shaped support member having a first leg and a second leg with said first and second legs disposed substantially normal to one another, said first and second legs each having a first end located adjacent to one another and a second end spaced from said first end, a flange located at the second end of each of said first and second legs and extending outwardly from said second end in the direction opposite to the direction in which the other said leg extends from said first end, each of said flanges having at least one opening therethrough for receiving a bar extending therethrough, wherein the improvement comprises a box-shaped section secured to and extending outwardly from each of said first ends of said first and second legs oppositely from the direction extending from the first end to the second end of said legs, said box-like section having a first wall extending outwardly from said first end of said first leg and a second wall extending outwardly from the first end of said second leg, one surface of said first wall facing toward said flange located at the second end of said first leg, one surface of said second wall facing toward said flange located at the second end of said second leg, and at least one other wall interconnecting the ends of said first and said second walls spaced outwardly from the first ends of said legs, said first wall and said at least one other wall having at least one opening extending through each of them and the openings being aligned with the at least one opening in said flange extending from said first leg for receiving therethrough the bar to be received through the at least one opening in the flange on said first leg, said second wall and said at least one other wall having at least one opening extending through each of them and the openings in said second wall and said at least one other wall being aligned with the at least one opening in said flange extending from said second leg for securing therethrough the bar to be received through the at least one opening in the flange on said second leg.

4,102,588

PIVOT MOUNTING OF LEVERS

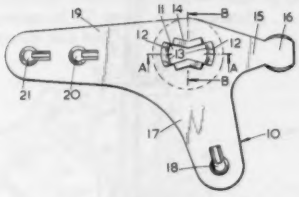
Philip Swingewood Jeavons, Birmingham, England, assignor to Wilmot-Breeden Limited, Birmingham, England

Filed Sep. 16, 1976, Ser. No. 724,066

Claims priority, application United Kingdom, Sep. 16, 1975, 37907/75

Int. Cl.[2] F16B 9/00

U.S. Cl. 403—245 **3 Claims**



1. The combination of a plastics lever and a metal support plate relative to which the lever is pivotable between first and second limiting positions; said lever having an aperture which receives a fixed blade projecting from the support plate and the blade being of rectangular form in elevation and including a reduced width neck portion intermediate its ends; the aperture consisting of two segments of a circle which are disposed in overlapping relationship with their medial axes in alignment and the central portions of two opposed sides of the segments being spaced apart a distance less than the spacing between the end portions of said sides of the aperture and the curvate boundary edge portions of the segments, which interconnect said end portions, including resilient locating formations which have snap-engagement with the reduced width neck portion of the blade.

4,102,589

METHOD OF AND MEANS FOR SAFELY RELEASABLY TENSIONING STRUCTURAL PARTS SUCH AS CLAMPING MEMBERS

Helmut Haas, and Klaus-Peter Baulig, both of Cologne, Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed May 21, 1976, Ser. No. 688,717

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522610

Int. Cl.[2] B25G 3/20

U.S. Cl. 403—373 **7 Claims**

1. In combination with clamping structures having complementary clamping portions for releasably clamping a member which is subject to constant vibrations in use, said clamping structures having spaced drawup portions:

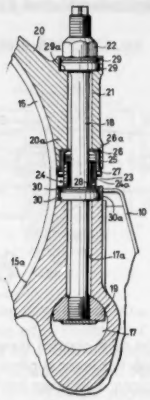
a securing and tensioning bolt extending in securing relation between said spaced drawup portions and adapted to be drawn up to effect an initial first stage drawing of said drawup portions toward one another to effect pressing of the clamping portions of said structures into retaining clamping engagement with said member to a sufficient prestress level to clamp said member firmly and positively in place but leaving said drawup portions in limited spaced relation defining a gap between the drawup portions;

said drawup portions having respective shoulders facing toward one another in surrounding relation about said bolt at opposite sides of said gap;

a two-part relatively adjustable safety spacer device extending across said gap and surrounding said bolt between said

shoulders without interfering with approach of said shoulders during said initial first stage drawing up of the drawup portions;

said two parts of the safety spacer device being adjustable relative to one another after said initial first stage drawup to engage thrustingly in positive rigid spacing relation against said shoulders to hold the spaced first stage drawn up drawup portions against further approach toward one another;



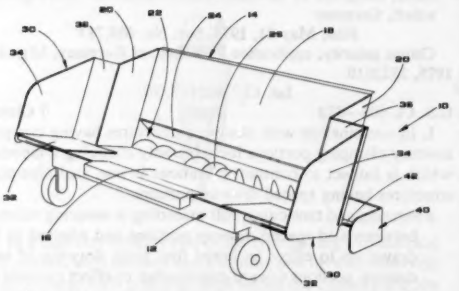
and said bolt being adapted to be drawn up into a second stage tensioned condition of the bolt on the drawup portions to strongly resist loosening of the bolt due to vibrations in the assembly, said adjusted safety spacer device rigidly maintaining said gap between the drawup portions and restraining the drawup portions against increasing clamping pressure of said clamping portions against said member beyond said initial first stage drawing up pressure exerted by action of said bolt on said drawup portions.

4,102,590

PULL TYPE ASPHALT PAVER

Edward A. Zanzie, St. Louis, Mo., assignor to Paving Products, Inc., St. Louis, Mo.

Filed Nov. 14, 1977, Ser. No. 851,150
Int. Cl.[2] E01C *19/18*
U.S. Cl. 404—110 **5 Claims**



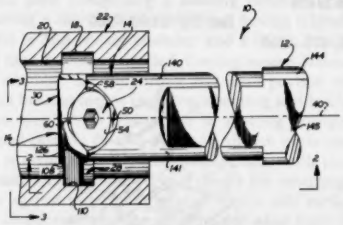
1. A pull type asphalt paver for spreading asphalt onto a road surface, said paver including a wheeled frame which supports a hopper for receiving asphalt from a dump truck associated therewith, said hopper having a bottom section, a back section and opposite side sections connecting the bottom and back sections to each other, said hopper also being provided with a chute in the vicinity of the juncture of the bottom and back sections through which the asphalt is discharged onto a road surface, said hopper further being provided with laterally movable wing sections on opposite sides of said hopper along bottom and side sections thereof to accomodate dumping of asphalt into the hopper when the dump truck bed is raised without causing contact between the dump truck and the paver, each laterally movable wing section on opposite sides of said hopper being provided with a bottom extension, side extension and back extension, the bottom and side extensions of each laterally movable wing section being laterally movable in and out relative to the bottom and side sections of the hopper, and the back extension of each laterally movable wing section being pivotally mounted relative to the side sections of the hopper in order to enable the back extension of each laterally movable wing section to be disposed substantially parallel to the side sections of the hopper and allow asphalt to be discharged through the bottom and side extensions of each laterally movable wing section.

4,102,591

CUTTING TOOL

Arnold B. Alcorn, Wooster, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Dec. 30, 1976, Ser. No. 755,734
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—100 **48 Claims**



1. A device for use in cutting material from within an opening formed in workpiece, said device comprising a longitudinally extending tool holder having an outer end portion adapted to extend into the opening in the workpiece, said outer end portion of said tool holder including surface means for defining a recess having a bottom surface and a flat planar side surface extending transversely to said bottom surface, said recess having at least one open end located at one end of said flat planar side surface, said outer end portion of said tool holder further including surface means for defining a threaded opening which extends transversely to said bottom surface of said recess, an insert adapted to be received in said recess in said outer end portion of said tool holder and having a cutting portion engageable with the workpiece, said insert having a top surface, a bottom surface opposite from said top surface and adapted to abuttingly engage the bottom surface of said recess, a first side portion interconnecting said top and bottom surfaces of said insert, said first side portion having a flat planar surface area adapted to abuttingly engage the flat planar side surface of said recess, a second side portion interconnecting said top and bottom surfaces of said insert and disposed opposite from said first side portion, said second side portion of said insert including side surface means for defining a recess intersecting said top surface and having an open side facing outwardly in a direction away from said first side portion of said insert, said side surface means sloping away from said top surface of said insert in a direction away from said first side portion of said insert, and a pair of opposite end portions interconnecting said top and bottom surfaces and disposed at opposite ends of said side portions, said end portions of said body being at least slightly smaller than said open end of said recess in said tool holder to enable said insert to be moved in said recess in said tool holder along a path extending parallel to said

flat side surface, and screw means for holding said insert against movement in said recess in said tool holder along said path, for pressing said bottom surface of said insert against said bottom surface of said recess in a tool holder and for pressing said flat planar surface area of said first side portion of said insert against said flat planar side surface of said recess in said tool holder, said screw means including a shank portion disposed in engagement with said threaded opening in said tool holder and a head end portion, said head end portion of said screw means extending through the open side of said recess in said insert into engagement with said side surface means to apply against said side surface means force having a component directed toward said bottom surface of said recess in said tool holder and another component directed toward said flat planar side surface of said recess in said tool holder.

23. A device for use in cutting material from within a workpiece, said device comprising an insert having a body adapted to be received in a recess in a tool holder, said body of said insert having a bottom surface adapted to engage a bottom surface of the tool holder recess, a top surface spaced apart from and extending generally parallel to said bottom surface, a pair of opposite side portions interconnecting said top and bottom surfaces, at least one of said side portions being adapted to engage a side of the recess in the tool holder, and a pair of opposite end portions interconnecting said top and bottom surfaces and disposed at opposite ends of said side portions, and a cantilevered cutting portion which is smaller than and integrally formed with said body and extends outwardly from one of said end portions, said cantilevered cutting portion having a cutting edge adapted to cut metal from the workpiece and a face surface extending from said cutting edge and intersecting said body at a location between said opposite side portions, said face surface extending at an acute angle to said top and bottom surfaces of said body, said cantilevered cutting portion extending outwardly from said one of said end portions for a distance which is less than the distance between said opposite end portions, said cantilevered cutting portion having a maximum width measured on said face surface parallel to said one end portion which is less than the distance between said opposite side portions, said cantilevered cutting portion having a pair of bottom surfaces which extend transversely to each other and to said face surface, one of said pair of bottom surfaces on said cantilevered cutting portion being disposed in a coplanar relationship with the bottom surface of said body, the other bottom surface of said pair of bottom surfaces being disposed in a plane which is coplanar with a surface of one of said side portions of said body.

4,102,592

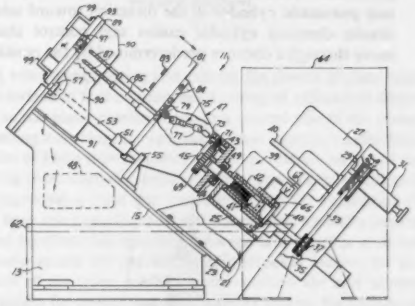
MULTIPLE SPINDLE INCLINED DRILLING MACHINE

Harold C. Mackinder, Livonia, Mich., assignor to Lincoln Park Engineering, Inc., Romulus, Mich.

Filed Aug. 5, 1977, Ser. No. 822,080
Int. Cl.[2] B23B *39/18*
U.S. Cl. 408—46 **14 Claims**

1. In a multiple spindle inclined drilling machine;
a base;
a bed on said base inclined at an acute angle to the horizontal in the range of 20° to 40°, approximately;
a drill unit mounted upon said bed, said drill unit including:
an internally splined cylinder rotatively journaled within the drill unit and inclined at a corresponding acute angle;
a piston rod with a splined connection to said cylinder projecting therefrom for effecting controlled reciprocal movements;
a multiple spindle head spaced above and slidably mounted on said bed and projecting forwardly of said drill unit and connected to said piston rod for reciprocal movements therewith;
an upwardly and rearwardly inclined fixture mount plate secured upon said bed lying in a plane at right angles thereto facing said head;
spaced parallel guide support rods above, parallel to and secured at one end to said bed with the other end of each rod secured to said mount plate;
apertured support means on and adjacent the forward end of said multiple spindle head, slidably and guidably mounted upon said rods;
a rotative drive means on said drill unit having a variable speed output shaft connected to said cylinder for rotating its piston rod;
and a plurality of drive spindles with individually mounted drills adjustably supported upon and within said head and connected to and rotated by said piston rod.

7. In a multiple spindle inclined drilling machine;
a base;
a bed on said base inclined at an acute angle to the horizontal in the range of 30° to 40° approximately;
guideways on said bed;



a slide spanning and guidably mounted upon said guideways;
a hydraulic cylinder assembly mounted upon said bed between said ways with its piston rod connected to said slide for effecting controlled reciprocal movements thereof;
a multiple spindle head mounted upon said slide and projecting forwardly thereof;
an apertured fixture adapter mounted upon said bed lying in a plane at right angles thereto and having an apertured upwardly and rearwardly inclined front face;
an upwardly and rearwardly inclined fixture mount plate spanning and overlying and secured to the front face of said adapter plate;
a power rotative drive means on said slide;
and a plurality of drive spindles with individually mounted drills, reamers, or taps adjustably supported upon and within said head and connected to said drive means.

4,102,593

FLUID PRESSURE DRILL FEEDING DEVICE

Keld Torben Schneider Sorensen, Auckland, New Zealand, assignor to K. & V. Sorensen Engineering Ltd., Auckland, New Zealand

Filed Feb. 27, 1976, Ser. No. 661,929
Claims priority, application New Zealand, Mar. 5, 1975, 176840
Int. Cl.[2] B23B *39/10, 47/16*
U.S. Cl. 408—130 **10 Claims**

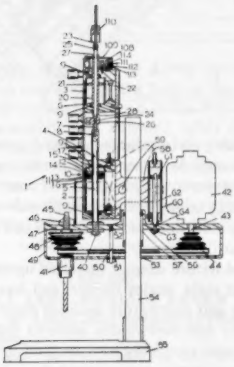
1. A drill comprising:
a support shaft;
a pneumatic cylinder rigidly affixed to said support shaft;
a control shaft passing through said pneumatic cylinder;
a pneumatic piston mounted within said pneumatic cylinder on said control shaft;
a hydraulic damping cylinder rigidly mounted with respect to said support shaft and positioned such that the longitudinal axes of said pneumatic cylinder and said hydraulic damping cylinder are in substantial alignment;
a hollow member passing through said hydraulic damping

cylinder and having said control shaft passing therethrough and extending from the ends thereof;

a hydraulic piston mounted within said hydraulic damping cylinder on said hollow member;

axially adjustable first engagement means between said control shaft member and said hollow member such that movement of the piston in said pneumatic cylinder in the direction away from said hydraulic damping cylinder causes said control shaft to move a distance predetermined by the position of said first engagement means on said control shaft before said first engagement means engages that end of said hollow member which is further from said pneumatic cylinder to thereby cause said hollow member to move said piston in said hydraulic damping cylinder;

second axially adjustable engagement means positioned on said control shaft between said hollow member and said pneumatic cylinder such that movement of the piston in said pneumatic cylinder in the direction toward said hydraulic damping cylinder causes said control shaft to move through a distance predetermined by the position of



said second engagement means on said control shaft before said second engagement means engages that end of said hollow member which is nearer said pneumatic cylinder to thereby cause said hollow member to move said piston in said hydraulic damping cylinder;

a support member rigidly affixed to said control shaft externally of said pneumatic cylinder and said hydraulic damping cylinder, said support member being slidably movable on said support shaft;

a drill shaft rotatably mounted on said support member and having a drill chuck mounted thereon, said drill shaft being mounted on said support member in a manner such that relative movement between said drill chuck and said support member in a direction substantially parallel to the longitudinal axis of said drill shaft is substantially prevented;

a motor carried by said support member so that for each change of position of said drill chuck there is a corresponding change in position of said motor; and

drive train provided between said motor and said drill shaft.

4,102,594

FLOATING REAMER

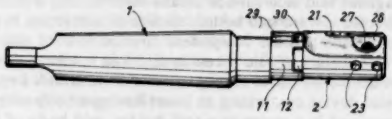
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany

Filed Nov. 2, 1976, Ser. No. 738,327

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2549325

Int. Cl.[2] B23B *29/02, 51/00, 27/16*

U.S. Cl. 408—186 **6 Claims**



1. A floating reamer comprising:

(a) a shank having an axis of rotation,

(1) one axial end portion of said shank being forked into two branches radially defining a recess therebetween and having respective guide faces in said recess,

(2) said guide faces being parallel to said axis of rotation,

(3) said shank having a third guide face axially bounding said recess and substantially perpendicular to said axis;

(b) a cutting head having an axis and three guide faces slidably engaging said guide faces of said shank respectively in said recess,

(1) two guide faces of said cutting head being parallel to and equidistant from the axis of said cutting head, and the third guide face of said cutting head being substantially perpendicular to the axis of said cutting head,

(2) the engaged guide faces of said shank and of said cutting head jointly constituting guide means for guiding said cutting head on said shank in a path toward and away from a position in which said axes coincide;

(c) a securing lug projecting from one of said branches into said recess, one of the two parallel guide faces of said cutting head being formed with a groove movably receiving said lug for axially securing said cutting head to said shank;

(d) two cutting blades mounted on said cutting head,

(1) each of said blades having at least one cutting edge elongated in the direction of the axis of said cutting head and projecting from said cutting head in opposite radially outward directions substantially parallel to said two guide faces of said cutting head,

(2) whereby said cutting head oscillates in said path under alternating stresses applied to said cutting edges;

(e) means for radially adjusting each blade on said cutting head and for fixedly securing each blade in the adjusted position; and

(f) two abutment members mounted on said shank and projecting into said path to limit movement of said cutting head away from said position.

4,102,595

BLEED VALVE CONTROL SYSTEM

Robert C. Wibbelsman, Cleves, Ohio, assignor to General Electric Company, Cincinnati, Ohio

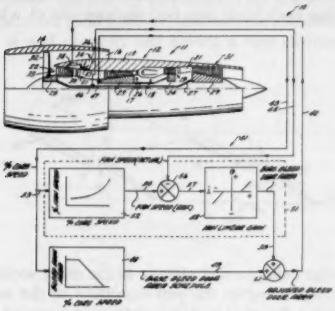
Filed Oct. 19, 1976, Ser. No. 733,876

Int. Cl.[2] F01D *17/06*

U.S. Cl. 415—1 **14 Claims**

1. An improved turbomachine bleed control system of the type having in serial flow relationship a first compressor, a bleed system, and a second compressor, the bleed system being capable of bleeding off discharge air from the first compressor in response to a bleed schedule which varies as a function of airflow in the second compressor wherein the improvement comprises:

a. means for sensing the first compressor speed and generating a biasing signal as a function thereof; and



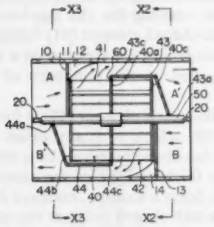
b. means for generating a modified bleed schedule by applying said biasing signal to the bleed schedule.

4,102,596

VENTILATING SUCTION AND EXHAUST FAN DEVICE OF SIROCCO TYPE

Shinichi Itayama, Osaka, Japan, assignor to Teizo Sakai, Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 782,781
Claims priority, application Japan, Mar. 31, 1976, 51/36534
Int. Cl.[2] F01D 3/02
U.S. Cl. 415—101 **6 Claims**



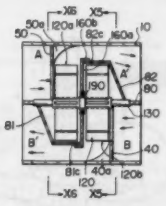
1. A ventilating suction and exhaust fan device of Sirocco type, characterized in that it comprises a casing of cylindrical shape; a partition plate mounted within the casing and extending in a horizontal plane passing through a central axis of the casing and having a rectangular opening formed therein; a cylindrical impeller of Sirocco type rotatably mounted in said opening of the partition plate coaxially with respect to the cylindrical casing, said impeller comprising a central vertical partition disc, a first cylindrical impeller section for exhaustion of air arranged on one side of the disc and a second cylindrical impeller section for suction of air arranged on the other side of the disc; first hood means for preventing the first impeller section from contacting the suction air; and second hood means for preventing the second impeller section from contacting the exhaust air.

4,102,597

VENTILATING SUCTION AND EXHAUST FAN DEVICE OF PLATE TYPE

Shinichi Itayama, Osaka, Japan, assignor to Teizo Sakai, Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 782,782
Claims priority, application Japan, Mar. 31, 1976, 51-36535
Int. Cl.[2] F01D 3/02
U.S. Cl. 415—101 **8 Claims**



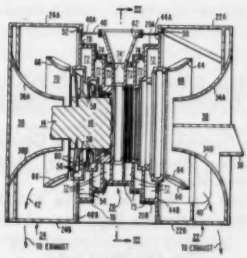
1. A ventilating suction and exhaust fan device of plate type, characterized in that it comprises a casing of cylindrical shape; a horizontal plane passing through a central axis of the casing and having a rectangular opening formed therein; a cylindrical impeller of Plate type rotatably mounted in said opening of the partition plate coaxially with respect to the casing, said impeller comprising at least one impeller section for exhaustion of air, at least one impeller section for suction of air and a central vertical partition disc disposed between said impeller sections; first hood means for preventing said impeller section for exhaustion of air from contacting the suction air; and second hood means for preventing said impeller section for suction of air from contacting the exhaust air.

4,102,598

SINGLE CASE LOW PRESSURE TURBINE

Alvin L. Stock, Nether Providence Township, Delaware County; Gravatt K. Roddis, Media, and William C. Nygren, Middletown Township, Delaware County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 11, 1975, Ser. No. 630,870
Int. Cl.[2] F01D 25/26, 25/24
U.S. Cl. 415—135 **8 Claims**



1. A low pressure turbine apparatus comprising:

a rotatable member having blades thereon;

a single casing member surrounding said rotatable member, said single casing member comprising only a center section and axial end sections joined at each axial end of said center section; and

flex plates disposed at each axial end of said center section in such manner that when said end sections are joined thereto said flex plates readily deform to allow differential thermal expansion between said center and end sections.

4,102,599

TURBINE-GENERATOR ASSEMBLY, INSTALLATION AND HOUSING

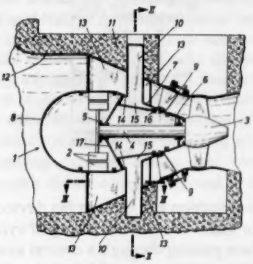
Gerhard Ziegler, Graz, Austria, assignor to Verinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Feb. 22, 1977, Ser. No. 770,900

Claims priority, application Austria, Apr. 13, 1976, 2712/76

Int. Cl.[2] F03B *11/02*

U.S. Cl. 415—219 R **4 Claims**



4. A housing assembly for a turbine-generator assembly which comprises a central assembly including a shaft, a generator and a water turbine which are axially spaced apart and non-rotatably connected to said shaft, and bearing means for said shaft, which housing assembly is adapted to be installed in a duct structure defining a flow passage and comprises

a shell adapted to surround said central assembly so that said turbine is near one end and said generator is near the other end of said shell and said turbine is adapted to receive water from said flow passage,

at least two arms, each of which projects radially from said shell and has an outer end adapted to be anchored in said duct structure, and an inner end disposed inside said shell,

a plurality of spars, each of which extends in said shell substantially parallel to the axis of said shaft and is rigid with the inner end of one of said radial arms and has mutually opposite first and second end portions, which are respectively nearer to said one end and said opposite end of said shell,

a peripheral reinforcing flange disposed in and rigid with said shell and with said first end of each of said spars, and

retaining means disposed in and rigid with said shell and with said second end portion of each of said spars, whereby said radial arms are rigidly interconnected.

4,102,600

MOVING BLADE RING OF HIGH CIRCUMFERENTIAL SPEED FOR THERMAL AXIALLY PASSED THROUGH TURBINES

Günter Schwab, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

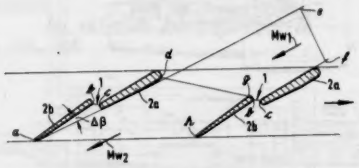
Filed Apr. 8, 1976, Ser. No. 674,752

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1975, 2515444

Int. Cl.[2] F01D *5/14*

U.S. Cl. 416—91 **2 Claims**

1. A blade ring combination of high circumferential speed for thermal axially passed through turbines and having blades each with a radially outer portion and a profile at a foot portion of a profile length extending from an upper region to the foot portion defining an exit edge along a side thereof, especially for the last stage of condensing steam turbines, with at least the radially outer portion of the blades of said blade ring lying within the range of transonic flow or within the range of supersonic flow, in which each blade of said blade ring changes from the profile at the foot portion of the blade toward the blade tip into a profile part defined to a major extent by at least nearly straight lines, the profile part of each of said blades at about one half of the profile length at the upper region thereof being provided with a slot located along its longitudinal axis and dividing each blade into two sections one of which with



the exit edge being turned relative to the other section by an angle corresponding to the post-expansion of the supersonic flow in such a direction that the profile part is turned about an angle so that the exit edge thereof lies in the flow-off direction to provide good efficiency of high Mach figures.

4,102,601

FORCED DRAFT FAN BLADE CONSTRUCTION FOR DYNAMO ELECTRIC MACHINES AND FORCED DRAFT AUTOMOTIVE ALTERNATOR

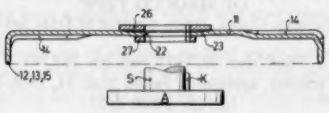
Guido Bischoff, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1976, Ser. No. 689,748

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1975, 2531889

Int. Cl.[2] F04D *29/20*

U.S. Cl. 416—183 **13 Claims**



1. Fan blade construction for dynamoelectric machines to provide forced air cooling for the machine comprising an essentially flat disk-shaped element (**11**) formed with a central opening (**22**) for mounting the element on a shaft (S) and fan blades (**12–15**) formed on the periphery of the disk-shaped element (**11**),

wherein the disk-shaped element (**11**) is formed with a central region (**23**) which is axially offset from the major plane of the disk-shaped element by a distance

(H) less than the thickness (T) of the material of the disk-shaped element to form a shallow, concave depression at one side thereof and a dish-shaped bulge at the other side thereof, said central offset region surrounding the central opening (**22**).

4,102,602

ROTOR FOR AN AXIAL TURBINE

Paul Rottenkolber, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,171

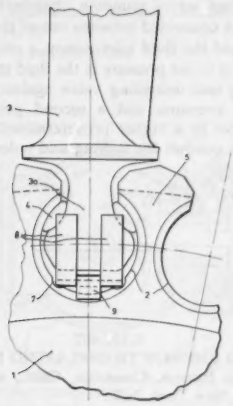
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639200

Int. Cl.[2] F01D *5/32*

U.S. Cl. 416—221 **8 Claims**

1. A rotor for an axial flow turbine comprising a metallic disk having a plurality of spaced apart undercut grooves around its periphery, a plurality of ceramic rotor blades, one mounted in each of said grooves, said rotor blades having an enlarged base portion having first supporting surfaces, for

engaging second supporting surfaces on said disk comprising the undercut portion of said grooves, and cushion pads interposed between said first and second supporting surfaces, each of said cushion pads being fabricated from resilient material having a selected yield pressure, less than the allowable surface pressure of said ceramic, and having a first cushion surface



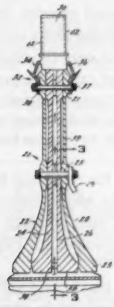
engaging one of said first supporting surfaces, said first cushion surface having a different radius of curvature in the relaxed state than said first supporting surface, said first cushion surface contacting said first supporting surface over a relatively small area when said rotor is at rest and said contact area increasing with rotation of said rotor as said surfaces are urged together by centrifugal force acting on each of said blades.

4,102,603

MULTIPLE SECTION ROTOR DISC

James Smith, Topsfield, and Richard Paul Johnston, Peabody, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 15, 1975, Ser. No. 640,766
Int. Cl.[2] F01D *5/08*
U.S. Cl. 416—244 A **22 Claims**



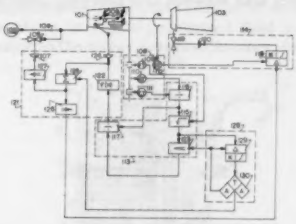
1. A rotor disk for turbomachinery comprising at least three discrete sections the innermost sections being progressively thicker than the outermost sections and all sections being of such a thickness that the stress created within an inner section upon failure of an adjacent outer section is substantially equal to the stress created in an outer section upon failure of the adjacent inner section.

4,102,604

METHOD AND APPARATUS FOR NONINTERACTING CONTROL OF A DYNAMIC COMPRESSOR HAVING ROTATING VANES

Alexander Rutshtein, and Naum Staroselsky, both of West Des Moines, Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa

Filed May 4, 1977, Ser. No. 793,761
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—19 **2 Claims**



1. A method of controlling a system including a dynamic compressor with rotating vanes having suction and discharge ports and a safe operating zone, a turbine driver, a pipeline connecting said discharge port to a user of a compressed gas, control members capable of moving a compressor's operating point along its required operating line by changing its performance, a fluid relief means connected to said pipeline, a flow measuring device installed in said suction port of the compressor, a pressure measuring device for measuring suction pressure, a temperature measuring means for measuring suction temperature, said method comprising:

calculating the mass flow rate and volumetric flow rate of a gas through the compressor;

changing the position of rotating vanes to maintain a constant optimum relationship between the vanes position and said volumetric flow rate through the compressor, said relationship being closen to provide for the maximum permissible level of speed of rotation along the line limiting the compressor's safe operating zone which corresponds to a widest safe operating range achievable without opening said fluid relief means;

controlling the required mass flow rate through the compressor by changing the speed of rotation until the compressor's operating point reaches said line limiting the safe operating zone; and

simultaneous and noninteractingly controlling the mass flow rate through the compressor and protecting compressor from approaching its zone of instable operation by simultaneously changing an outflow through said fluid relief means, limiting said maximum permissible level of the speed of rotation and maintaining said optimum relationship between the position of rotating vanes and the volumetric flow rate through the compressor after its operating point reaches said line limiting its safe operating zone.

4,102,605

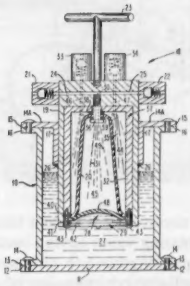
FLUID PUMPING DEVICE

Seymour Moskowitz, 36 Brandon St., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 596,506, Jul. 16, 1975, Pat. No. 4,021,148. This application Jan. 24, 1977, Ser. No. 761,862
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] F04F *11/00*
U.S. Cl. 417—98 **10 Claims**

1. A fluid pumping device comprising a closed container configured to receive a fluid, plunger means received within said container and constrained for movement relative thereof, said plunger means including sleeve means forming an interior channel and thermally conductive, flexible membrane means,

said sleeve means constrained for movement within said container, said flexible membrane means connected to said sleeve means and forming at least first and second chambers within said channel, at least a portion of said second chamber disposed within said first chamber, said first chamber constituting a charging chamber and said second chamber constituting a pumping chamber, first inlet means and first outlet means communicating with said charging chamber, second inlet means and second outlet means communicating with said pumping chamber, said second inlet and outlet means including valve means, at least a portion of said flexible means constituting a common wall between said charging chamber and said



pumping chamber, a fluid to be pumped entering said pumping chamber through said second inlet means and exiting said pumping chamber through said second outlet means, a charging fluid entering said charging chamber through said first inlet means and exiting said charging chamber though said first outlet means, said thermally conductive, flexible membrane means operative to control heat transfer between said pumping fluid and said charging fluid, variable pressure to volume ratios are provided by controlling said charging fluid entering and exiting said charging chamber as said plunger means moves within said container and said fluid to be pumped enters said pumping chamber through said second inlet means and exits said pumping chamber through said second outlet means.

4,102,606

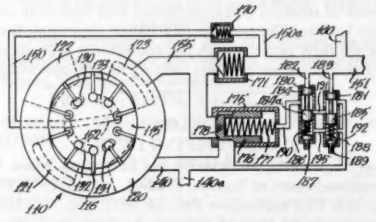
MULTIPLE DISPLACEMENT PUMP SYSTEM HAVING CONTROL SEQUENCE FOR UNLOADING VALVE

Melvin F. Huber, and Lowell D. Hansen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 470,988, May 17, 1974, Pat. No. 3,953,153. This application Mar. 15, 1976, Ser. No. 666,774

Int. Cl.[2] F04B *23/10, 49/00*

U.S. Cl. 417—204 **1 Claim**



1. A multiple displacement pump system including a vane pump with a rotor carrying a plurality of vanes movable in a pumping path between fluid inlet means and fluid outlet means with a first set of pumping chambers between said vanes and a second set of pumping chambers beneath said vanes, port plate means having ports for connecting said fluid inlet means and said fluid outlet means to said sets of pumping chambers at timed intervals in rotation of the rotor, said fluid outlet means having two separate conduits for receiving fluid from the respective sets of pumping chambers, said fluid inlet means having a single conduit for delivering fluid to the respective sets of pumping chambers, and circuit means including a fluid utilization conduit for delivering either flow from both of said separate conduits to said fluid utilization conduit or only flow from said second set of pumping chambers and having an unloading valve connected between one of the conduits of the outlet means and the fluid inlet means, a pressure-responsive valve responsive to the pressure in the fluid utilization conduit for unblocking said unloading valve against movement at a predetermined pressure, and a second pressure-responsive valve responsive to a higher predetermined pressure in the fluid utilization conduit for shifting said unloading valve to a blocking position.

4,102,607

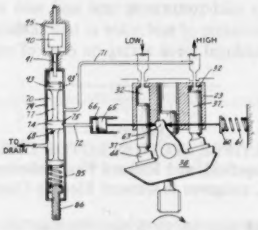
FLUID ENERGY TRANSLATING DEVICE

William Joseph Benson, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 455,968, Mar. 29, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,455

Int. Cl.[2] F04B *1/30;* **F01B** *13/06*

U.S. Cl. 417—222 **6 Claims**



1. In a fluid energy translating device having an expansible chamber for translating fluid under pressure between low and high pressure ports, and in which displacement of the chamber is determined by a control member having a nul position for essentially non-displacement and a second position establishing displacement, means to locate the control member in nul position upon occurrence of excessive pressure or excessive temperature of fluid being translated and comprising:

(a) a plunger engaging said control member and operated by fluid under pressure to dispose said control member in nul position;

(b) a valve chamber for receiving high pressure fluid translated by said device and a control passage leading therefrom for directing high pressure fluid to the plunger;

(c) a valve in said chamber for closing and disclosing said passage;

(d) means applying a bias to said valve normally to locate the valve in closing position in opposition to fluid pressure tending to locate the valve in opening position;

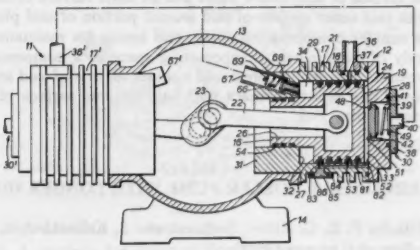
(e) a thermal element positioned in a temperature sensing chamber to sense an excessively high operating temperature of fluid being translated and having an extendable portion in alignment with and directly engageable with said valve in opposition to said valve bias means; and

(f) passage means for delivering fluid being translated into and out of said temperature sensing chamber.

4,102,608
RECIPROCATORY PISTON AND CYLINDER MACHINES

Guenter Karl Willi Balkau, Springvale; Eckhard Bez, Moorabbin, and John Lascelles Farrant, North Balwyn, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 22, 1976, Ser. No. 753,382
Claims priority, application Australia, Dec. 24, 1975, 4394/75; Feb. 26, 1976, 5014/76
Int. Cl.[2] F04B 49/00
U.S. Cl. 417—242 23 Claims



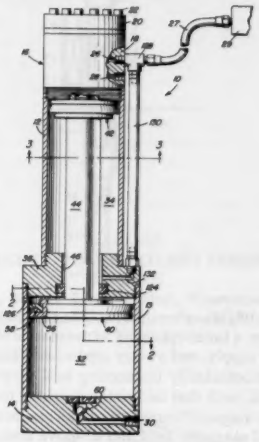
1. A vacuum pump comprising:
a cylinder having a first portion closed at one end and a second portion contiguous with, but of smaller diameter than, the first portion;
a piston having a head portion slidable in the first cylinder portion and a second piston portion of smaller diameter than the head portion and slidable in the second cylinder portion, said piston head portion having a front face facing the closed cylinder end and an annular back face;
a gas inlet for inlet of gas to the interior of the first cylinder portion between the front face of the piston head portion and the closed cylinder end on reciprocation of the piston;
a first exhaust duct for exhaustion of gas from the interior of the first cylinder portion ahead of the piston head portion by pumping action of the front face of the piston head portion;
a one-way valve in said first exhaust duct operable by gas pressure thereon to permit exhaustion of gas from the interior of the first cylinder portion ahead of the piston head portion but closable against reverse gas flow;
an exhaust means for exhaustion of gas from the interior of the first cylinder portion behind the piston head portion by pumping action of the back face of the piston head portion; and
a gas transfer passage for transfer of gas from said interior of the first cylinder portion ahead of the piston head portion to the interior of the first cylinder portion behind the piston head portion by pumping action of the front face of the piston head which gas transfer passage is capable of said transfer of gas at gas pressures lower than required to open said one way valve.

4,102,609
VALVE CONTROL SYSTEM FOR AIR POWERED VACUUM PUMP

Howard L. Wood, Wolf Point, Mont., assignor to Wood's Powr-Grip Co., Inc., Wolf Point, Mont.

Continuation-in-part of Ser. No. 612,924, Sep. 12, 1975, abandoned. This application Dec. 28, 1976, Ser. No. 755,078
Int. Cl.[2] F04B 17/00, 35/00; F01B 7/18; F01L 33/00
U.S. Cl. 417—399 11 Claims

1. In combination with a source of fluid under pressure and a power output member reciprocated through a fixed power stroke, a fluid motor device for displacing the power output member through a return stroke from one end of said power stroke, comprising a housing enclosing a motor pressure chamber, a motor piston connected to the power output member and slidably mounted in the housing, a control valve assembly connected to the housing for establishing fluid communication between said source and the motor pressure chamber to effect displacement of the motor piston through the return stroke, including a valve body, a valve element movably mounted in the valve body and displaceable between operative positions, respectively, conducting pressurized fluid from said source to the motor pressure chamber and depressurizing the motor pressure chamber, means for continuously biasing the valve element to one of said operative positions, actuating means engageable by the motor piston at said one end of the power stroke for displacement of the valve element to the other of the operative positions in which pressurized fluid is conducted from the source to the motor pressure chamber, fluid pressure



means connected to said source for holding the valve element in said other of the operative positions during movement of the motor piston through the return stroke, and pressure control means fluidly connected to the fluid pressure holding means for regulating pressurization of the motor pressure chamber during the return stroke of the motor piston, said fluid pressure holding means comprising a diaphragm connected to the valve element, means within the housing enclosing opposing pressure chambers on opposite sides of the diaphragm, said valve element conducting unrestricted flow of the pressurized fluid from the source to one of the opposing pressure chambers in said other of the operative positions thereof, and pressure modifying means for establishing fluid communication between the pressure control means and the other of the opposing chambers.

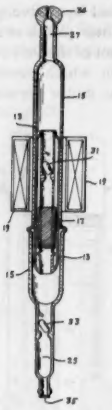
4,102,610
CONSTANT VOLUME SEAL-FREE RECIPROCATING PUMP

John Taboada, 159 Ebbtide, San Antonio, Tex. 78227, and Marvin H. Lindsey, 3911 E. Palfrey, San Antonio, Tex. 78223

Filed Sep. 3, 1976, Ser. No. 720,465
Int. Cl.[2] F04B 17/04
U.S. Cl. 417—417 1 Claim

1. An electromagnetic reciprocating pump for handling biomedical fluids, gases, mixtures of gases and fluids and the like under sterile conditions free of contamination, said pump comprising a vertically oriented hollow elongate cylinder having a check valve at the lower extremity thereof, a tubular elongate piston slidably positioned in said cylinder for vertical movement therein, a magnetic component fixedly attached to said piston for movement therewith, a solenoid coil surrounding the outside of said cylinder in close proximity thereto for producing an external magnetic field, said solenoid coil being

positioned immediately above the magnetic component attached to said piston to cause upward movement of said piston by attracting the magnetic component attached thereto, valve means located in said piston for controlling the flow of fluids through said pump in response to cyclic applications of the magnetic field thereto, and a power supply for alternately energizing and deenergizing the solenoid coil producing the external magnetic field including a serially connected trans-



former and full wave rectifier, a Zener diode connected across said rectifier, a timer operating in the astable mode powered by said power supply, and a relay controlled by the output of said timer for momentarily connecting said power supply to the solenoid coil, such that said piston is caused to move upward in response to magnetic attraction of said magnetic component by the external magnetic field and to move downward under the influence of gravity when the magnetic field is deenergized.

4,102,611

PLUNGER PUMP

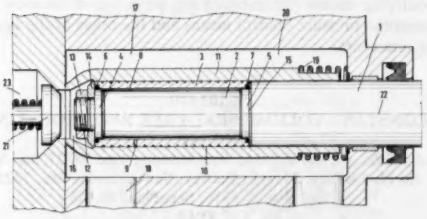
Erich Bröker, Oelde, Fed. Rep. of Germany, assignor to Paul Hammelmann Maschinenfabrik, Oelde, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 785,730

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615530

Int. Cl.[2] F04B *21/02, 39/10*

U.S. Cl. 417—469 **11 Claims**



1. A plunger pump comprising, in combination, a pump housing having a pumping chamber and an end wall; an elongated plunger mounted in said pump housing for reciprocation longitudinally thereof between a retracted and an extended position, at least partly received in said pumping chamber, and having a free end facing said end wall, a first portion longitudinally spaced from said free end and having an external surface, and a second portion extending from said first portion of said free end and having an outer surface inwardly offset from said external surface; a sleeve valve mounted on said plunger for displacement longitudinally thereof and for limited reciprocation therewith between an open and a closed position in which said sleeve valve is spaced from, and in sealing contact with, said end wall, respectively, said sleeve valve, when in said closed position, subdividing said pumping chamber into a pressure space within, and a suction space around, said sleeve valve and having an internal surface in sealing contact with said external surface of said plunger; means for admitting a fluid into said suction space; means for discharging the fluid from said pressure space; and means for sealing said pressure chamber with respect to said suction chamber, including a sealing sleeve surrounding said second portion of said plunger and having an outer contact surface juxtaposed with said internal surface of said sleeve valve and an inner surface bounding with said outer surface of said second portion of said plunger an annular compensating space, and means for maintaining a body of fluid in said compensating space at a compensating pressure sufficient to press said contact surface of said sealing sleeve into sealing contact with said internal surface of said sleeve valve.

4,102,612

REVERSIBLE ROLLER PUMP WITH LONGER HOSE WEAR

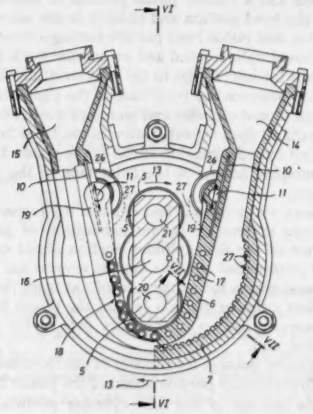
Wilhelm F. K. G. Ritter, Gothaestrasse 3, Kaltenkirchen, Fed. Rep. of Germany (2358)

Filed Jul. 6, 1976, Ser. No. 702,877

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530149

Int. Cl.[2] F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—477 **12 Claims**



1. A hose pump comprising:

a pump housing (22) having an inlet, an outlet, and an arcuate housing portion interposed therebetween;

a roller assembly rotatably journalled in said housing adjacent said arcuate housing portion, said roller assembly having rollers (5) spaced from said housing portion and sequentially passing along said housing portion when said assembly is rotated; and

a flexible hose (1) interposed in the space between said roller assembly and said arcuate housing portion and having ends located in said inlet and outlet, said hose having an outer wall (7) in abutment with said arcuate housing portion and an inner wall (6) sequentially traversed by said rollers to compress it against said outer wall portion, said hose having, in a portion adjacent at least one of the hose ends, a valve flap (10) embedded in the wall of the hose, said flap being mounted on an axle (11) extending externally of said hose and journalled in said housing generally parallel to the axis of rotation of said roller assembly, said

valve flap being tiltable with said axle for blocking said hose responsive to the traversing of said hose by said rollers.

4,102,613

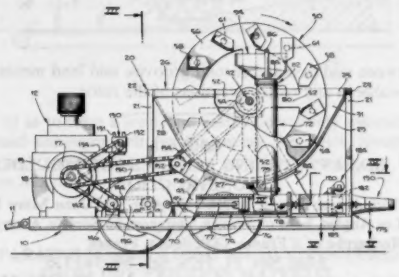
CONCRETE PUMPING MACHINE

Martin T. Vukich, 10891 Olinda St., Sun Valley, Calif. 91352

Filed Jan. 6, 1977, Ser. No. 757,482

Int. Cl.[2] F04B *7/06, 15/02*

U.S. Cl. 417—516 **6 Claims**



1. A machine for pumping flowable material comprising:

a hopper containing a supply of flowable material,

means forming a charging chamber extending vertically in the hopper and having an upper inlet and a lower outlet, the upper inlet projecting above the maximum level of material in the hopper;

a pump including a pumping chamber having an outlet end and a piston in the pumping chamber cyclically movable toward and away from the outlet end, the pumping chamber being provided with an inlet charging port communicating with the charging chamber lower outlet and with the pumping chamber outlet end;

conveyor means for moving flowable material from the hopper to a discharge station above the upper inlet of the charging chamber;

and closure means for closing said upper inlet during piston movement toward said outlet end.

4,102,614

MACHINES FOR GENERATING MOTION

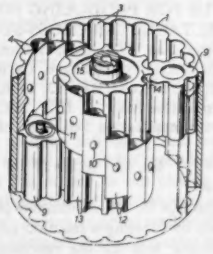
Bernard Gold, 54 Ashley La., Hendon London, England (NW4 1PL)

Filed Feb. 25, 1977, Ser. No. 771,949

Claims priority, application United Kingdom, Feb. 25, 1976, 7458/76

Int. Cl.[2] F04C *1/02*

U.S. Cl. 418—59 **9 Claims**



1. A machine for generating motion comprising a mutually rotatable co-axial assembly of an internally toothed outer member, a generally cylindrical intermediate core and an externally toothed inner member; an even number of circumferentially evenly spaced toothed gate elements rotationally carried by said core at alternately opposite axial ends, these gate elements meshing with said members; closure means at each axial end of said assembly to seal off the space between inner and outer members and each to sealingly co-operate with one end face of the respective one or group of said gate elements; two arrays of pistons respectively axially slidable along the teeth of the inner and outer members and which co-operate with the inner and outer faces of the core; guide means on said core faces determining paths for both arrays of pistons that direct them with a close sliding fit between the other end faces of the gate elements and the closure means remote therefrom, said space thus being divided by said pistons and said gate elements into double said number of similar mutually separate chambers of generally curved triangular shape; and means providing fluid passages to and from said chambers.

4,102,615

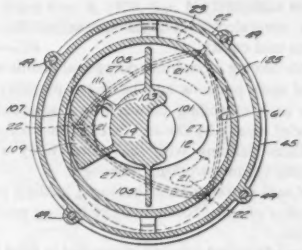
INTERNALLY COOLED ROTARY COMBUSTION ENGINE

Finn T. Irgens, 2424 N. Harding Blvd., Wauwatosa, Wis. 53226

Filed Oct. 13, 1976, Ser. No. 732,024

Int. Cl.[2] F01C *21/06*

U.S. Cl. 418—86 **14 Claims**



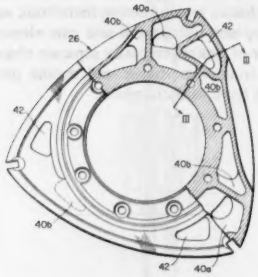
1. A rotary internal combustion engine comprising a housing including wall means including spaced sides defining a rotor cavity, a rotor shaft rotatably supported by said housing, extending through said rotor cavity, and including an eccentric, a rotor rotatably supported on said eccentric and within said rotor cavity, said rotor including equi-angularly spaced apexes which, together with said rotor cavity, define working chambers rotatable within said rotor cavity, said rotor also including side seal means engaging said rotor cavity sides to restrain leakage of pressure from said working chambers, meshed gear means on said rotor and on said housing for causing rotation of said rotor on said eccentric and rotation of said rotor shaft relative to said housing, and a gas recirculation system extending, at least in part, in said housing and including means defining a closed gas recirculation path including, a first path portion in said rotor through which gas flows in one direction axially of said rotor, a second path portion in said rotor shaft through which gas flows in the direction opposite said one direction and, a third path portion located interiorly of said housing in series communication with and between said first and second path portions and in position for receiving gas leaking past said rotor side seals, and fan means driven by said engine for pumping gas through said recirculation path.

4,102,616

ROTARY PISTON INTERNAL COMBUSTION ENGINE AND ROTOR THEREOF

Yoshikazu Ishikawa, Chofu, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed May 14, 1976, Ser. No. 686,315
Claims priority, application Japan, Jun. 2, 1975, 50-75126[U]
Int. Cl.[2] F02B *55/04*
U.S. Cl. 418—91 **7 Claims**



1. A rotary piston internal combustion engine comprising:
means for supplying a cooling liquid medium to the engine;
an outer body having a pair of spaced end walls and a peripheral wall disposed between the end walls to form a cavity therebetween having an axis along which said end walls are spaced, the inner surface of said peripheral wall having a multilobed profile of basically epitrochoidal outline;
a shaft transpiercing said end walls coaxially with said outer body cavity and having an eccentric portion disposed within said cavity;
a rotor journaled on said eccentric portion for rotation within said cavity;
said rotor having a generally polygonal profile with a plurality of apex portions and having a plurality of working faces each extending between two adjacent apexes and bounded axially by the end faces of said rotor, said working faces defining with said outer body a plurality of variable volume working chambers;
each of said working faces having a leading portion in the direction of rotor rotation and a trailing portion opposite thereto;
a portion of said rotor being connected in fluid flow relation with the supplying means so that there is a heat exchange between the liquid medium and the rotor whereby the liquid medium has a tendency to cool each trailing portion; and
at least one compartment means provided on said rotor adjacent a region of each of said trailing portions of said working faces and adapted for reducing the cooling effect of the cooling liquid medium on each trailing portion.

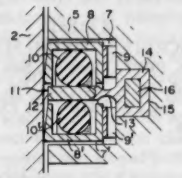
4,102,617

OIL SEAL MEANS IN A ROTARY PISTON ENGINE

Kazuo Kato, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 29, 1977, Ser. No. 782,397
Claims priority, application Japan, Nov. 12, 1976, 51-136702
Int. Cl.[2] F01C *19/00*; F04C *15/00, 27/00*
U.S. Cl. 418—142 **5 Claims**

1. An oil seal means in a rotary piston engine comprising first and second annular oil seal grooves concentrically formed in the side wall of a rotor, and first and second combinations of oil seal rings, annular spring means and annular elastic seal elements, said first and second combinations being mounted in said first and second grooves, respectively, wherein the improvement comprises a flexible annular land means provided



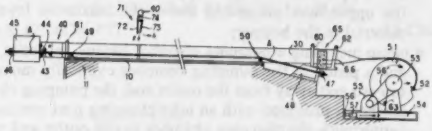
between said first and second grooves, said land means being movable in any radial directions of the rotor.

4,102,618

MANUFACTURING BENCHES FOR MOULDED CONSTRUCTION

Robert Joseph Ernest Augier, Sorgues, and Jean Marc Eliche, Les Angles, both of France, assignors to Societe Anonyme de Recherche et d'Etudes Techniques, France

Filed Nov. 11, 1976, Ser. No. 741,135
Claims priority, application France, Nov. 17, 1975, 75 35018
Int. Cl.[2] B28B *7/06*
U.S. Cl. 425—64 **14 Claims**



1. A manufacturing bench for molded construction elements comprising: a plurality of molds having lateral walls and a bottom wall, said lateral walls comprising flexible blades having upper and lower edge portions and said bottom wall comprising an elongated table, said lateral walls being arranged such that the lower edge portions of said blades contact said table to form each of said molds, said lateral walls being secured at one of their ends to a drum for moving said walls in a longitudinal direction, a winch operatively associated with said drum, said winch being connected to motive means for driving said winch, said drum said winch and said motive means being slidably mounted at one end of said bottom wall and being operatively connected to jack means for maintaining said lateral walls taut.

4,102,619

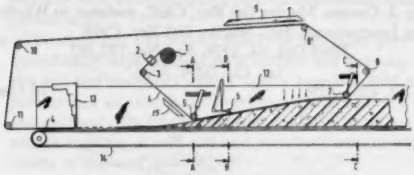
APPARATUS FOR PRODUCING FOAM SLABS OF RECTANGULAR CROSS-SECTION

Horst Bokelmann, Bad Wildungen, Germany, assignor to Metzeler Schaum GmbH, Memmingen, Germany

Division of Ser. No. 676,603, Apr. 13, 1976, Pat. No. 4,056,595. This application May 25, 1977, Ser. No. 800,604
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517664
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—89 **6 Claims**

1. In the apparatus for the continuous production of rectangular foam slabs by foaming a reaction mixture, the apparatus having a conveyor belt for the reaction mixture, a system operatively associated with said conveyor belt for mixing the reaction mixture and feeding it to the belt, a pair of vertical webs as sidewalls for the lateral confinement of the rectangular foam slab resulting upon foaming of the reaction mixture while on the belt, a floor web on the conveyor belt and and a cover web for the foam slab, the improvement which comprises

means operatively associated with said belt for removing said cover web from a foam surface downstream of the feeding system, means operatively associated with said conveyor belt for twice reversing the direction of advance of said removed



cover so as to form a loop, and means operatively associated with said conveyor belt for advancing the twice reversed cover web to serve as the floor web for subsequently fed reaction mixture.

4,102,620

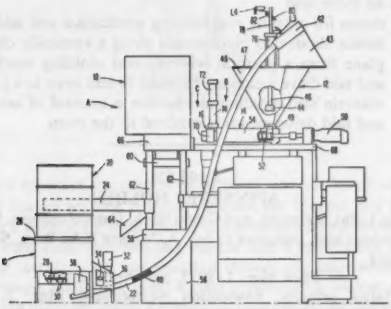
APPARATUS FOR MOLDING RIGID STRUCTURES FROM DRY FRICTION MATERIAL

Edward Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 637,914, Dec. 5, 1975, Pat. No. 4,003,498, which is a division of Ser. No. 633,054, Nov. 18, 1974. This application Dec. 27, 1976, Ser. No. 737,880

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—147 **6 Claims**



1. Apparatus for forming rigid structures such as disk brake pads from a dry mix of light and fluffy friction material, comprising in combination:

(a) a compression molding press having an openable mold with at least one mold cavity therein;

(b) a plasticizing screw, enclosed in a heated housing mounted on said press, for at least partially plasticizing a charge of dry friction material by extruding said charge at an elevated temperature through a nozzle at one end of said housing;

(c) a cup having an open end facing said nozzle, said cup being adjacent to said nozzle, for receiving the preheated extrusion from the nozzle as the charge of plasticized friction material is extruded through said nozzle and into said cup, said cup having a curved wall acting to shape the extrusion into a compact preformed mass as the extrusion enters the cup from the nozzle;

(d) a transfer chute, having inlet and outlet ends, for transferring the compact preformed mass from the cup into said mold cavity prior to closure of the mold, said chute inlet end communicating with said cup and said chute outlet end communicating with said mold cavity;

(e) a mixing hopper of air-tight construction, for storing and agitating said dry mix of friction material, at a position remote from said plasticizing screw;

(f) a stuffer hopper of closed construction disposed above said plasticizing screw housing, having a bottom outlet connected via a conduit to an inlet of said plasticizing screw housing, for temporary storage of a portion of said dry mix of friction material as said dry mix of friction material is fed thereinto intermediate to being fed into said plasticizing screw housing, said stuffer hopper including a reciprocable plunger, within said hopper, for displacing said dry mix of friction material from within said stuffer hopper downward through said bottom outlet and into said plasticizing screw housing on a plunger downstroke;

(g) a mechanical conveyor of closed construction from which substantially no friction material can escape to ambient air, operatively associated with said mixing hopper and said stuffer hopper to transport said dry mix of friction material along a closed path from said mixing hopper to said stuffer hopper; and

(h) first control means operably associated with said mechanical conveyor, for governing transport of material to said stuffer hopper by said mechanical conveyor whenever time for a downward portion of a reciprocation of said reciprocable plunger exceeds a first predetermined time.

4,102,621

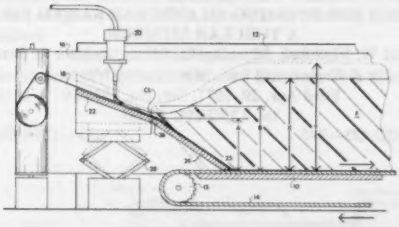
APPARATUS FOR PRODUCING POLYURETHANE FOAM BUNS OF VARYING HEIGHTS

Miles E. Talbert, High Point, N.C., assignor to Thomasville Products, Inc., High Point, N.C.

Filed Oct. 8, 1976, Ser. No. 730,800

Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—224 **1 Claim**



1. In foaming machines of the type where liquid foam reactants are poured onto a pour plate from above from whence they flow by gravity to a point where a creamline is formed and thence into an open top, closed side and bottom, channel-shaped conveyor, which carries the mixture away from the pour plate as it expands and cures into a bun, the improvement wherein said pour plate comprises

(a) an upper, planar inclined section onto which said liquid reactants are poured from nozzles above;

(b) a lower connecting wall having a planar surface and hingedly attached along the upper edge thereof to the lower edge of said upper section, said connecting wall having a lower edge lying supported on, but unattached to said conveyor;

(c) elevating means engagable with said upper section only for raising and lowering said upper section without changing the angle of inclination thereof;

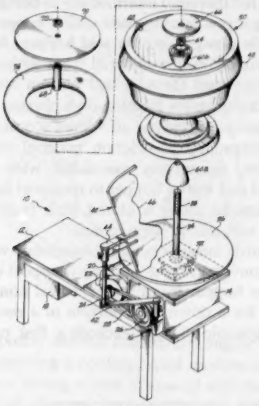
(d) so that the bun height is altered responsive only to the activation of said elevating means without any change of inclination of the pour plate.--

4,102,622

MACHINE FOR MAKING A PLANTER

Thomas Melvin Simpson, 10024 16 Ave. SW., Seattle, Wash. 98106

Filed Aug. 19, 1976, Ser. No. 715,717
Int. Cl.[2] B28B *1/29*; B29C *23/00*
U.S. Cl. 425—268 6 Claims



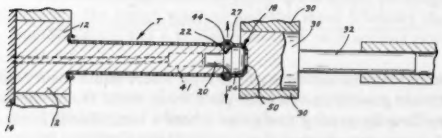
1. A machine for forming a planter comprising: a platform; an arbor extending through and connected to the platform; means on said arbor and said platform for fastening a work piece, making up parts of a planter, to the platform and arbor; a drive system means for rotating the arbor and platform with work piece at a few revolutions per minute; and means for adjustably positioning a shaper tool with respect to the work piece, said tool to remain stationary as the platform arbor and work piece rotate to shape the outside contour of the planter.

4,102,623

DEVICE FOR FORMING AN ANNULAR RAISED RIB ON A TUBULAR MEMBER

Donald W. Mathison, Minneapolis, Minn., assignor to Product Design & Engineering Inc., Minneapolis, Minn.

Filed Apr. 29, 1977, Ser. No. 792,356
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—393 4 Claims



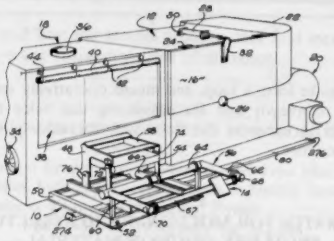
1. A device for forming an annular raised rib on a tubular member comprising:
(a) a mandrel including a primary portion,
(b) a secondary mandrel portion,
(c) means slidably mounting said secondary mandrel portion upon the outer end of said primary mandrel portion axially thereof,
(d) the inner end of said primary mandrel portion carried by a base,
(e) an expandable member carried between said secondary mandrel and the outer end of said primary mandrel,
(f) a movable die,
(g) means for moving said movable die to contact and move said secondary mandrel,
(h) said secondary mandrel portion having means thereon for expanding said expandable member radially outwardly thereof to thereby form an annular raised rib on a tube of plastic mounted on said mandrels when said die is caused to move said secondary mandrel.

4,102,624

ROTATIONAL MOLDING APPARATUS

Peter J. Corona, Marina Del Rey, Calif., assignor to Windsurfing International, Inc., Marina Del Rey, Calif.

Filed Oct. 14, 1976, Ser. No. 732,267
Int. Cl.[2] B29C *5/04*
U.S. Cl. 425—429 16 Claims



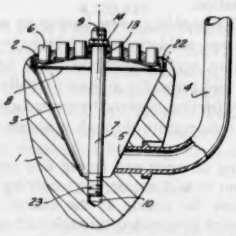
1. A rotational molding apparatus which comprises:
a. a holding mechanism for receiving a mold;
b. a drive means for imparting rotational motion to said holding mechanism;
c. a support structure;
d. pivot means for attaching said holding mechanism and said drive means to said support structure;
e. an oven; and
f. means for rotating said holding mechanism and said drive means about said pivot means along a vertically disposed plane from a position wherein said molding mechanism and said drive means are external to said oven to a position wherein said molding mechanism is internal of said oven and said drive means is external to the oven.

4,102,625

SPINNERET HOLDER

Fritz Lüthi, Kehrsatz, and Guido Bach, Ostermundigen, both of Switzerland, assignors to Ing. A. Maurer S.A., Bern, Switzerland

Filed Mar. 1, 1977, Ser. No. 773,191
Claims priority, application Switzerland, Mar. 2, 1976, 2576/76
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—464 12 Claims



1. A spinneret holder comprising:
a cupped base part having a rim centered on an axis;
a cover part having a periphery snugly interfittable with said rim and defining with said base part a generally closed chamber centered on said axis;
a plurality of spinnerets mounted on said cover part;

means for introducing a mass to be spun into said chamber and for expelling said mass as filaments from said chamber through said spinnerets;

a rod lying generally on said axis and having threads anchored in one of said parts, the other part being formed at said axis with a throughgoing hole through which said rod passes; and

an element on said rod bearing axially on said other part only immediately adjacent said hole thereof and pressing said rim and said periphery axially tightly together, said other part having an axial face turned away from said one part and engaged only by said element said parts being pressed axially together at said rim and periphery exclusively by means of said rod and element.

4,102,626

APPARATUS FOR MANIPULATING PARISONS IN BLOW MOLDING MACHINES

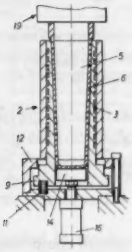
Helmut Scharrenbroich, Neunkirchen, Fed. Rep. of Germany, assignor to Voith-Fischer Kunststofftechnik GmbH & Co. KG, Lohmar, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,430

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610258; Apr. 3, 1976, 2614451

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—526 **10 Claims**



1. In a machine conversion of parisons into bottles or other hollow shaped articles wherein parisons are formed in a first mold at a parison forming station and wherein the parisons are transported from said forming station into a blow mold at a blowing station via a conditioning station, the improvement comprising a tempering mold at said conditioning station, said tempering mold including a tubular section having an open end for introduction of successive parisons, means for supporting said section at said conditioning station with freedom of axial movement with respect to said supporting means, and means for biasing said section to a predetermined axial position with respect to said supporting means so as to enable said section to yield against the opposition of said biasing means by moving substantially axially from said predetermined position in response to introduction of a parison by way of said open end; and means for introducing parisons into said section.

4,102,627

DRAFT TELL-TALE FOR FIRED FURNACES

Robert D. Reed; Hershel E. Goodnight, and Vern A. Street, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Oct. 7, 1976, Ser. No. 730,167

Int. Cl.[2] F23N *3/00*

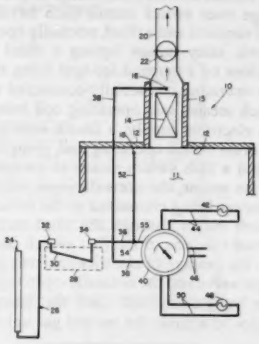
U.S. Cl. 431—16 **6 Claims**

1. In a fired furnace system in which combustion air is supplied to said furnace, said furnace having a roof, a convection section, a stack, and a stack flow control means, the improvement for monitoring the draft of said air inside the furnace comprising:

a. first pressure sensor means inside, at roof of said furnace, indicating the draft of said air P1 at that position;

b. second pressure sensor means inside said furnace downstream of the convection section, indicating the draft of said air P2 at that position;

c. differential pressure measuring means connected between said first and second pressure sensor means; and



d. alarm means connected to said differential pressure measuring means, set at a selected value of pressure drop; and in which

e. said first and second pressure sensor means each comprise a closed cavity contructed of a pipe closed at one end and having a plurality of substantially equally circumferentially spaced openings about the pipe near the closed end.

4,102,628

CONTROL APPARATUS FOR GAS BURNING APPLIANCE

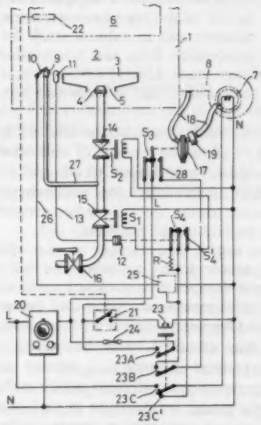
Paul Frederick Goff, Warwick; Bernard William Knight, Long Itchinton, and Kenneth James Prentice, Southam, all of England, assignors to Potterton International Limited, Warwick, England

Filed Dec. 8, 1976, Ser. No. 748,571

Claims priority, application United Kingdom, Feb. 23, 1976, 7032/76

Int. Cl.[2] F23Q *9/12*

U.S. Cl. 431—43 **4 Claims**



1. A control apparatus for a fanned, gaseous fuel-burning appliance which comprises: a first gas valve for controlling

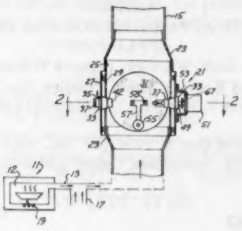
flow of gas to a lighting jet; an electrical ignition means for igniting gas at said jet; a main gas burner disposed adjacent said lighting jet; a second gas valve for controlling flow of gas to said main burner; a first sensor for detecting the existence or non-existence of a flame at said lighting jet; a second sensor for detecting the existence or non-existence of a predetermined air flow created by an electrically driven fan means; electrical circuitry for initiating a predetermined lighting-up sequence, said first and second sensors comprising, respectively, first and second change over switch means each having a normally-closed pair of contacts and a third, normally open contact; and, electromagnetic relay means having a third switch means arranged to close on a demand for heat being indicated to the apparatus, an operating coil serially-connected with a demand-for-heat switch means, said operating coil being serially connected to an electrical supply, a fourth switch means which, upon energization of said operating coil, completes a self-holding circuit, and a fifth switch means to energize said electrically driven fan means, the normally-open contact of the second switch means being connected to the common contact of the first switch means through the third switch means, the normally-closed contacts of the first switch means being connected, upon the passage of electrical current thereto, to actuate the first gas valve and the normally-open contact of the first switch means being connected, upon the passage of electrical current thereto, to actuate the second gas valve.

4,102,629

EXHAUST STACK DAMPER CONTROL

Emanuel Feinberg, Southfield, Mich., assignor to Paragon Resources, Inc., Southfield, Mich.

Filed Oct. 18, 1976, Ser. No. 733,260
Int. Cl.[2] F23N *3/04*
U.S. Cl. 431—20 **10 Claims**



1. An automatic exhaust stack damper device for a combustion heating device of the type having a burner disposed in a combustion chamber and an exhaust stack for exhausting the products of combustion from said combustion chamber, said automatic exhaust stack damper device comprising:

a damper section mounted to form a section of said exhaust stack;

a damper movably mounted in said damper section and adapted to allow the passage of said combustion gases in an open position and upon moving to a closed position, adapted to substantially close said exhaust stack;

damper motor means operative when activated to move said damper to said closed position;

bias means urging said damper to said open position, said damper motor acting to overcome said bias means and move said damper to said closed position;

burner control means activating said damper motor means when said burner operation is discontinued;

fusible means mounted to be heated by said combustion gases exhausted through said exhaust stack, said fusible means comprising an element which melts upon reaching a predetermined temperature in said exhaust stack, said predetermined temperature corresponding to the operation of said burner with said damper in said closed position;

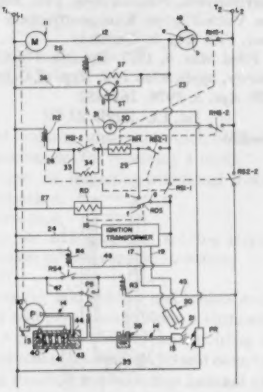
means for causing opening of said damper by said bias means upon melting of said fusible means element, not withstanding said damper motor being activated, whereby said automatic exhaust stack damper is fail safe in that in the event of burner operation with said damper motor activated due to system malfunction, said damper is opened by said bias means.

4,102,630

BURNER CONTROL SYSTEM

Hans Per Reinhold Edman, Stockholm, Sweden, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 23, 1976, Ser. No. 744,378
Int. Cl.[2] F23N *5/00*
U.S. Cl. 431—29 **7 Claims**



1. A burner control system comprising a pump for supplying pressurized liquid fuel to a burner nozzle for atomization and combustion, a fuel line leading from said pump to the nozzle, a regulating valve connected within said line between said pump and said nozzle, a passage bypassing said regulating valve and communicating a portion of said line upstream of said regulating valve with a portion of said line downstream of said regulating valve, valve means disposed in said line downstream from said regulating valve and said passage for movement between a first position blocking flow of the fuel from said pump to the nozzle and a second position permitting the flow of fuel from the pump to the nozzle, a first circuit for controlling the ignition of the fuel in a burn cycle by means of a first signal including, a thermostat, igniter means for lighting the fuel discharged from the nozzle in response to a demand for heat sensed by the thermostat, means for de-actuating said igniter means in response to combustion of the fuel at the nozzle, and a second circuit operatively connected to said first circuit and including switch means movable from a first position to a second position for opening said valve means for purging air through said passage and said line at the beginning of the burn cycle in response to said first signal in said first circuit, before the pressurized fuel from said regulating valve is directed to flow through said line to the nozzle, said switch means being adapted for movement from said first position to said second position when said igniter is de-actuated, and means sensitive to the pressure of fuel in said fuel line for maintaining said valve means in its open position as long as the fuel pressure does not drop substantially below a predetermined high pressure during combustion and for causing said valve means to close when the pressure does drop substantially below said predetermined pressure.

4,102,631
BATTERY OPERATED LIGHTER EQUIPPED WITH A BATTERY OPERATED TIMEPIECE

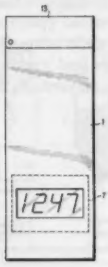
Kenjiro Goto, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Dec. 27, 1976, Ser. No. 754,003

Claims priority, application Japan, Dec. 27, 1975, 50-178952[U]

Int. Cl.² F23Q *2/32*

U.S. Cl. 431—253 **18 Claims**



1. A battery operated lighter equipped with a battery operated timepiece comprising:
- a casing;
- a fuel tank for maintaining a gas fuel;
- a burner nozzle for issuing the gas fuel from said fuel tank;
- a lighter ignition circuit for generating a spark at said burner nozzle;
- a timepiece circuit having a time indication unit;
- a battery for supplying electric energy to said lighter ignition circuit and said timepiece circuit;
- a switch used in common for manipulating said two circuits and including a first, second and third switch contacts; and
- a control means provided in mechanical connection with said switch, wherein said first and second switch contacts are adapted to close said lighter ignition circuit and wherein the positional relationship of these first and second switch contacts is controlled by said control means so that one of said first and second switch contacts may selectively brought into contact with said third switch contact to manipulate said timepiece circuit.

4,102,632
MODULAR HEAT RECUPERATOR

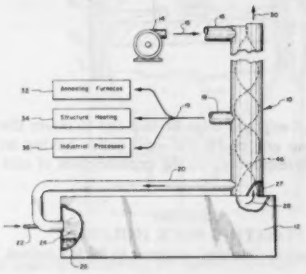
Phillip Hastings, 1819 S. 1100 East, Salt Lake City, Utah 84105

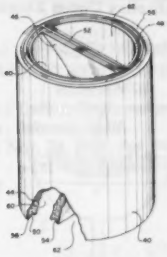
Filed Nov. 22, 1976, Ser. No. 743,826

Int. Cl.² F28F *1/10*

U.S. Cl. 432—3 **2 Claims**

1. A heat recuperator system in combination with a high temperature combustion furnace for heating combustion air to the furnace comprising:
- a plurality of recuperator modules adapted to be interconnected together to form a heat recuperator, each recuperator module having as an integral part thereof at least one septum for axially dividing the interior of the module so as to form at least first and second flow channels in heat exchange relationship, the recuperator modules each having means for aligning the ends of the septum with the ends of the septa of adjacent modules so as to maintain said first and second channels separated after the modules have been interconnected;
- a plurality of gasket means interposed between the modules to inhibit leakage from the flow channels;
- means for directing exhaust gases from the combustion furnace into the first flow channel;
- means for forcing air into the second flow channel counter-directionally to the flow of exhaust gases in the first flow channel;
- means for combining a portion of the air from the second flow channel with a fuel, the air serving as combustion air for the fuel in the combustion furnace;
- means for placing the interconnected recuperator modules in axial alignment to compensate for dimensional variations in the heat recuperator caused by temperature fluctuations in the heat recuperator;





- means for supporting the interconnected recuperator modules in a vertical orientation thereby placing the interconnected recuperator modules under axial compression from gravitational forces;
- means for diverting a second portion of air from the second flow channel after it has been in heat exchange relationship with the exhaust gases in the first flow channel; and
- means for supplementing the air in the second flow channel with the combustion-supporting gas.

4,102,633
CIGARETTE LIGHTER

Conrad Zellweger, Chêne-Bougeries, and André Guenin, Petit-Lancy, both of Switzerland, assignors to La Nationale S.A., Geneva, Switzerland

Filed Sep. 17, 1976, Ser. No. 724,228

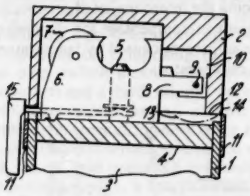
Claims priority, application Switzerland, Sep. 26, 1975, 12537/75

Int. Cl.² F23Q *25/00*

U.S. Cl. 431—152 **3 Claims**

1. A cigarette lighter including, a body having an interior including a fuel container, partition means closing the top of said container, a fuel burner, ignition means for igniting fuel issuing from said burner, a hollow cap having an interior and a lower side edge and disposed atop said body, said cap when in a closed position covering said burner and ignition means when the lighter is not being used, said cap and body having an identical cross-section and respectfully having exposed edges juxtaposed when said lighter is closed, hinge means disposed within one said interior and joining said cap to said partition said hinge means spacing at least that portion of the edge of said cap adjacent the hinge means from the respective edge of

said body so that the cap can pivot open freely without hitting the respective edge of the body or the partition means, a collar mounted around the exterior of said body and surrounding the



periphery of said exposed edge of said cap to cover the space between said cap and body, and said collar having an inner cross-section corresponding to the cross-section of said cap.

4,102,634

FLOATING WICK HOLDER

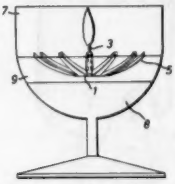
David Crisp, London, England, assignor to Rizla Limited, Wales Wales

Continuation-in-part of Ser. No. 445,951, Feb. 26, 1974, abandoned. This application Feb. 22, 1977, Ser. No. 770,842

Claims priority, application United Kingdom, Feb. 26, 1973, 9447/73

Int. Cl.[2] F23D *3/02*

U.S. Cl. 431—298 **3 Claims**



1. A floating wick-holder for a lamp, said wick-holder being molded in one piece from a plastic material which has a density less than that of combustible oil and is naturally buoyant thereon, said wick-holder including a central portion defining a generally cylindrical hole for directly receiving and retaining a wick, a peripheral portion disposed around the central portion and offset axially therefrom, and at least one arm linking the central portion to the peripheral portion, the volume of said central portion relative to the entire volume of said wick-holder being such that said portion will displace less weight of oil than the total weight of said wick-holder causing said central portion and at least part of said linking arm to sink below the surface when said wick-holder is placed in oil thereby to preclude flame damage to said wick-holder when the wick is ignited.

4,102,635

METHOD OF AND AN ARRANGEMENT FOR PRE-HEATING COKING COAL

Kurt-Günther Beck, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

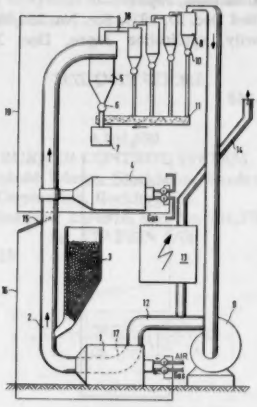
Filed Jun. 13, 1977, Ser. No. 806,277

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626653

Int. Cl.[2] F26B *3/08*

U.S. Cl. 432—14 **15 Claims**

1. A method of pre-heating coking coal, comprising the steps of entraining the coal in a stream of a gaseous carrier medium such is at a first temperature exceeding that of the coal; passing the stream through a pre-heating zone in which the carrier medium pre-heats the coal; and introducing into said pre-heating zone, at a region thereof at which the coal has already been pre-heated to a predetermined temperature by the carrier medium, a gaseous fluid at a second temperature exceeding



that of the carrier medium at said region for additionally pre-heating the already partly pre-heated coal in said zone at and downstream of said region.

4,102,636

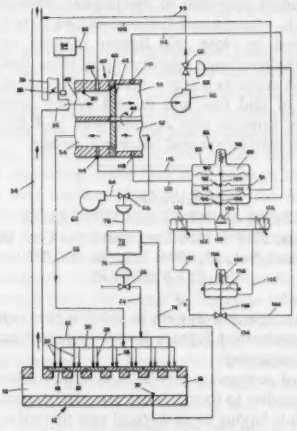
FURNACE WITH HEAT EXCHANGER FLOW CONTROL

William A. Phillips, Comstock Park, and David R. Dietz, Grand Rapids, both of Mich., assignors to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Dec. 3, 1976, Ser. No. 747,392

Int. Cl.[2] F28D *19/00*

U.S. Cl. 432—30 **13 Claims**



8. In a method of heating articles in an industrial heating zone comprising:

supplying heated gases to the heating zone;

removing heated exhaust gases from the heating zone and passing at least a portion of the heated gases through a first side of a rotary ceramic heat exchanger wheel to strip heat therefrom;

passing air through a second side of the rotary ceramic heat exchanger wheel to heat the air;

passing the air, thus heated, to the heating zone for heating the articles therein; and

controlling the temperature of the gases in the heating zone at least in part by controlling the flow of air through the second side of the rotary heat exchanger wheel and to the furnace to maintain the temperature within a predetermined range of temperatures;

the improvement which comprises:

maintaining the ratio of the flow of gases across the first side of the rotary heat exchanger wheel to the flow of gases across the second side of the rotary heat exchanger wheel at a predetermined value by measuring the flow of gases across the first and second sides of the rotary ceramic heat exchanger wheel and controlling the flow of gases across the first side of the rotary ceramic heat exchanger wheel independent of the control of the flow of gases across the second side of the rotary heat exchanger wheel to maintain the ratio at the predetermined value.

4,102,637

WORK SUPPORT FOR VACUUM ELECTRIC FURNACES

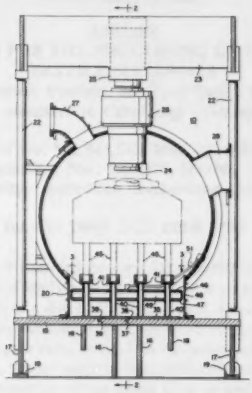
Benjamin A. Kreider, Richboro, and William J. Metalsky, Warminster, both of Pa., assignors to Abar Corporation, Feasterville, Pa.

Filed Sep. 16, 1976, Ser. No. 723,767
Int. Cl.[2] F27D *5/00*
U.S. Cl. 432—227 **12 Claims**

1. A work support for vacuum electric furnaces which comprises

a flat base plate,

a plurality of pin members of the same length for load support by their upper end faces secured to and extending vertically upwardly from said plate,



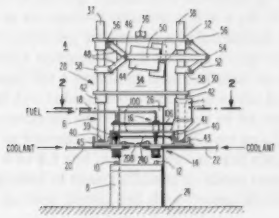
heat sink means having an internal passage for circulating a liquid cooling medium above said base plate through which said pin members extend in heat exchange relation.

4,102,638

APPARATUS FOR BURNING TOGETHER LEAD STORAGE BATTERY POSTS AND HIGH PROFILE BUSHINGS

Eric G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Filed Nov. 24, 1976, Ser. No. 744,541
Int. Cl.[2] F24J *3/00*
U.S. Cl. 432—229 **19 Claims**



1. An apparatus for burning together a lead battery post and a lead bushing surrounding said battery post, comprising:

(a) an orbital torch burner means for applying heat in an orbital path between said post and said bushing; and

(b) a torch burner support plate for supporting a torch burner means immediately above said post and bushing, said orbitable torch burner means rotating in said support plate in close proximity to said battery post and bushing.

4,102,639

AMINE SALTS OF REACTIVE DYESTUFFS

Anton Zenhausern, Oberwil; Otto Reber, Basel, and Peter Aeschlimann, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 495,517, Aug. 7, 1974, Continuation-in-part of Ser. No. 201,560, Nov. 23, 1971. This application Sep. 30, 1976, Ser. No. 728,194

Claims priority, application Switzerland, Nov. 24, 1970, 17418/70

Int. Cl.[2] D06P *1/38*

U.S. Cl. 8—1 A 14 Claims

1. A process for the dyeing of organic fibre material, comprising

(a) impregnating this material with a solution of at least one amine salt of reactive dyestuffs of Formula I

$$D - X \frac{}{}_{(m)} SO_2\text{-}CH_2CH_2\text{-}Z^{\ominus} \; [\; Y\text{-}H \; \frac{}{}H^{\oplus} \qquad (I)$$

wherein D represents the radical of an organic dyestuff selected from an azo, formazan, anthraquinone, phthalocyanine, nitro and triphenylmethane dyestuff containing no salt-forming, water-solubilising groups, X represents the bridge member $-CH_2-$, $-CH_2CH_2-$ or

$$-\overset{|}{N}-R,$$

wherein R represents hydrogen, an alkyl group having 1 to 5 carbon atoms, or a cycloalkyl group, $Z^{\ominus}$ represents the $-O\text{-}SO_3{}^{63}$, $-SSO_3{}^{\ominus}$ or $-OPO_3H^{\ominus}$ group, Y represents the radical of a primary or secondary amine Y-H, which amine is capable of salt formation, and is selected from the group consisting of

1. a mono- or dialkylamine having a total of from 2 to 20 carbon atoms in the alkyl groups which groups are unsubstituted or are substituted by hydroxy or methoxy;
2. a mono- or dicycloalkylamine which is unsubstituted or substituted by alkyl of from 1 to 8 carbon atoms or hydroxylower-alkyl;
3. a mononuclear, mono- or diaralkylamine which is unsubstituted or substituted by alkyl which is unsubstituted or substituted by hydroxy, methoxy or cyano;
4. a mononuclear aromatic amine;
5. benzamidine, or an alkylamidine having from 2 to 18 carbon atoms in the alkyl radical and which may be substituted by alkyl of from 1 to 4 carbon atoms, phenyl, benzyl or cyclohexyl;
6. an isothiourea S-substituted by benzyl or alkyl of from 1 to 18 carbon atoms;
7. an N-containing five- or six-membered heterocycle and
8. a condensed N-containing heterocycle; and n represents the number 1 or 2,

(I) in a solvent which consists of non-polar aprotic organic solvent selected from unsubstituted or halogenated hydrocarbons having a boiling point above 30° C, or

(II) in a solvent mixture which consists of

(α) non-polar aprotic organic solvent selected from unsubstituted or halogenated hydrocarbon having a boiling point above 30° C, and

(β) a polar organic solvent selected from the group consisting of alkanols, cycloaliphatic alcohols, araliphatic alcohols, aliphatic or cycloaliphatic ketones, alkylene glycol monoalkyl ethers, furfuryl alcohol, tetrahydrofurfuryl alcohol, bivalent aliphatic alcohols, lower cyclic ethers, lower anhydrous monocarboxylic acids, N,N-dialkylamides of lower monocarboxylic acids, amides of carbonic acid, cyclic amides, lower carboxylic acid nitriles and mixtures thereof;

(b) removing a substantial part of excess dye liquor from the material and

(c) fixing the dyestuff by a subsequent heat treatment of the impregnated or printed fibre material at temperatures below the softening point of the fibre material, thereby obtaining a finished dyeing or print on the said fibre material.

4,102,640

PROCESS FOR THE PROCESSING OF ORGANIC TEXTILE MATERIALS

Jacques Zurbuchen, Pratteln, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 561,513, Mar. 24, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,274

Claims priority, application Switzerland, Mar. 29, 1974, 4424/74

Int. Cl.[2] D06P *5/02;* B08B *3/00*

U.S. Cl. 8—73 9 Claims

1. A dyeing or finishing process for organic textiles, consisting of the steps of applying a liquor which is an aqueous dispersion or solution of a dye or finishing agent, having affinity for the textile, in the substantial absence of surfactants, to a textile at a goods to liquor ratio of 1:0.3 to 1.2, subsequently applying saturated steam to the textile to heat the textile and to dilute the liquor by condensation of the steam so as to uniformly distribute the liquor over the textile before a temperature is reached which would fix the dye or finishing agent to the textile fibers, provided that the diluted liquor is completely absorbed by the textile, and finally fixing the dye or finishing agent by the continued application of saturated steam.

4,102,641

METHOD OF DYEING HUMAN HAIR WITH REACTIVE DYES

Fred M. Tuffile, Lakeville, Mass., and Andrew J. Cunningham, Highland Lakes, N.J., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Sep. 29, 1972, Ser. No. 293,473

Int. Cl.[2] A61K *7/13*

U.S. Cl. 8—10.1 7 Claims

1. A process of dyeing human hair comprising applying to the hair fibers in an aqueous solution and at a pH of about 4 to 6.5 an effective coloring amount of a halotriazinyl compound, which compound contains a dye residue group and a water solubilizing group for a period of time sufficient to allow good leveling of said dye, subsequently applying to the hair an aqueous solution containing sufficient amounts of an alkaline compound having an ionization constant sufficient to adjust the pH to from about 8 to 8.5 and maintaining said pH range of about 8 to 8.5 for a period of time sufficient to allow reaction of the dyestuff with the hair fibers, and then rinsing the hair fibers.

4,102,642

TREATMENT OF FABRIC COMPRISING COTTON OR KERATINOUS FIBERS FOR SHRINK RESISTANCE

John B. Banks, 4 Page St., Augusta, Me. 04330

Filed Apr. 30, 1976, Ser. No. 681,902

Int. Cl.[2] D06M *1/02, 3/04*

U.S. Cl. 8—125 6 Claims

1. A process for imparting wash and wear characteristics including dimensional stability to a fabric consisting essentially of cotton fiber comprising the steps of contacting said fabric with a solution consisting essentially of a metal sulfite selected from the group of aluminum sulfite, sodium sulfite, lithium sulfite, potassium sulfite, barium sulfite, calcium sulfite, magnesium sulfite, manganese sulfite, strontium sulfite and zinc sulfite, said metal sulfite being present in an amount of about 5% to 35% by weight, and 1 to 50 percent by weight of a soluble carbonate, selected from the group of alkali and alkaline earth carbonates, based on the weight of sulfite in said solution, said solution having a temperature of from 150° F. to its boiling point, drying the fabric thoroughly and thereafter washing the fabric, said fabric being contacted with said solution for a sufficient time to produce a fabric of dimensional stability such

that the maximum shrinkage during laundering does not exceed 4 percent.

4,102,643

DECATIZING OF FABRICS

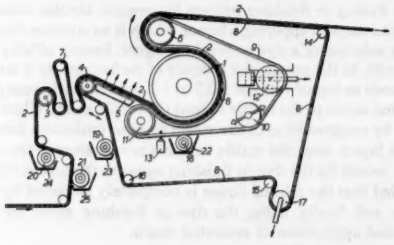
Dieter Riedel, 4952 Porta Westfalica-Hausberge, Turmblick 6, Fed. Rep. of Germany

Continuation of Ser. No. 637,051, Dec. 2, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,238

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1974, 2456921

Int. Cl.[2] D06C *15/06*

U.S. Cl. 8—149.3 **2 Claims**



1. A method of continuously decatizing and effectively pressing a fabric material said method comprising: providing a feed path for the fabric material; providing a rotatable, heated, decatizing cylinder on said feed path having a continuous mirror finish surface; providing a moisturizing device on said feed path upstream of said decatizing cylinder, continuously feeding a backing cloth having a dense and smooth surface across said moisturizing device and around said mirror finish surface of said decatizing cylinder, continuously feeding the fabric to be treated along said feed path whereby the fabric passes across said moisturizing device and across said mirror finish surface of said cylinder in direct contact with said mirror finish surface of the cylinder, with the fabric being located between said mirror finish surface of said cylinder and the adjacent said dense and smooth surface of said backing cloth; and providing a thrust belt under high tension to thrust said backing cloth and the fabric material towards said mirror finish surface of said cylinder, whereby elongation of the fabric does not occur throughout the period of said direct contact with said mirror finish surface of said cylinder and the fabric thus ironed and pressed has improved handling properties.

4,102,644

TINT COMPOSITIONS FOR NYLON HAVING IMPROVED FUGITIVITY PROPERTIES

Peter Jacob Hauser, Inman, S.C.; James Easton Hendrix, La Grange, Ga., and Hans Heinrich Kuhn, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 3, 1976, Ser. No. 720,213

Int. Cl.[2] D06P *3/00, 5/08*

U.S. Cl. 8—164 **9 Claims**

1. Fugitive tint compositions for amorphus, undrawn nylon or fully drawn cationic dyeable nylon comprising an admixture of a colorant having the formula

$$R - \{N - [(CH_2CH_2O)_nH]_2\}_x$$

wherein R is an organic dyestuff radical, x is an integer of 1 to 6, and the product of $2n$ times x is from about 200 to 300, and at least 30 weight percent of a water-soluble polymeric resin having a molecular weight of from about 4,000 to about 10,000.

4,102,645

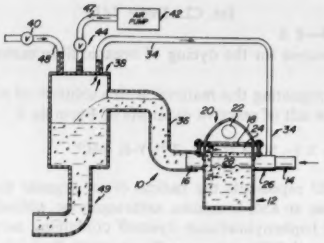
STERILIZATION APPARATUS

Thomas E. Meacham, Jr., Philadelphia, and David C. Johnson, Ambler, both of Pa., assignors to Refreshment Machinery Incorporated, Warminster, Pa.

Filed Jun. 23, 1976, Ser. No. 699,026

Int. Cl.[2] A61L *3/00*

U.S. Cl. 21—102 R **5 Claims**



1. Apparatus for sterilizing a liquid with radiation comprising a housing having a chamber provided with an inlet, an outlet in the side wall of the housing adjacent the upper end thereof and through which liquid may exit from said chamber, means for sterilizing a liquid by radiation while the liquid is in said chamber, a window transparent to radiation from said sterilizing means, means associated with said inlet for discharging the liquid downwardly into the chamber in a direction away from the window, said window being disposed below said sterilizing means so that radiation may enter said chamber, said window defining the upper limit of said liquid in said chamber, and means for producing and maintaining an air pocket between said window and the upper surface of any liquid in said chamber to prevent direct contact between the liquid and said window without using a barrier between the air pocket and the liquid.

4,102,646

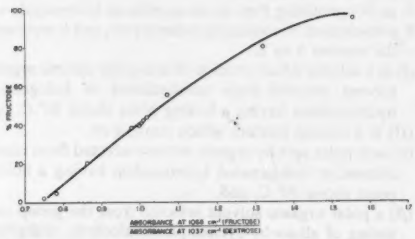
QUANTITATIVE ANALYSIS OF CARBOHYDRATES BY INFRARED SPECTROSCOPY

Ronald T. Sleeter, 1263 Semor Dr., Decatur, Ill. 62521

Filed Apr. 6, 1977, Ser. No. 785,163

Int. Cl.[2] G01N *21/30*

U.S. Cl. 23—230 R **6 Claims**



1. A proccess for qualitatively and quantitatively analyzing a chemical composition for its content of starch or sugars which comprises:

(a) subjecting a sample of said composition to infrared spectroscopy at wave lengths in the region of 1800–700 cm^{-1} or the region of 700–50 cm^{-1} to produce a spectrum;

(b) noting the amplitude of the absorbances at the known frequencies for each carbohydrate or family of carbohydrates, and

(c) comparing each noted amplitude with known amplitudes for standard samples of that same carbohydrate or family

of carbohydrates to determine the amount of that carbohydrate or family of carbohydrates present in the composition.

4,102,647

REMOVAL OF CONDENSATES FROM LIGHT GASEOUS STREAMS

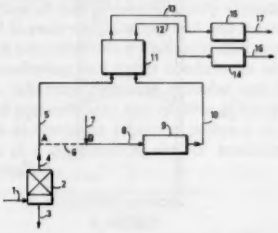
Adriaan Roelse, Domburg, and Barteld Hendrik van der Ley, Middelburg, both of Netherlands, assignors to Total Raffinaderij Nederland N.V., Rotterdam, Netherlands

Filed Nov. 15, 1976, Ser. No. 741,993

Claims priority, application Netherlands, Nov. 20, 1975, 7513573

Int. Cl.[2] G01N *31/08;* B01D *53/02*

U.S. Cl. 23—232 R **8 Claims**



1. In a process for the quantitative determination of water in a light gaseous stream the improvement comprising the removal of condensates from said gaseous stream by passing said gaseous stream over an oleophilic substance, said substance comprising a polystyrene which has been cross-linked with a mixture of divinylbenzene and ethylvinylbenzene.

4,102,648

MEASURING NON-METHANE HYDROCARBON CONTENTS IN GASES

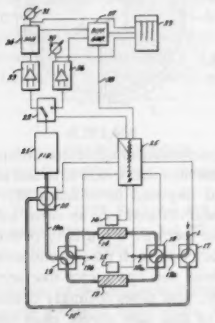
Karl Hartmann, Schöneck, and Wolfgang Treis, Bad Soden, am Taunus, both of Fed. Rep. of Germany, assignors to Hartmann & Brawn Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 15, 1977, Ser. No. 806,773

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626905

Int. Cl.[2] G01N *31/10, 31/12;* B01D *53/16*

U.S. Cl. 23—254 EF **5 Claims**



1. Apparatus for measuring the non-methane portion in the hydrocarbon content of gases comprising:

an unheated adsorbing device containing uncoated, active carbon and receiving a portion or sample of said gas, the carbon being exposed to the gas for removing the hydrocarbons therefrom, except the methane by adsorbing these hydrocarbons;

flame ionization means for measuring the total hydrocarbon content in said sample gas and for separately measuring said sample gas having passed through said adsorbing device to obtain a representation of the methane content only in the carbon gas; and

means for obtaining an indication of the measuring signals as provided by said flame ionization means from which to obtain an indication of the non-methane hydrocarbon content in said sample gas.

4,102,649

METHOD AND DEVICE FOR AGITATING A LIQUID

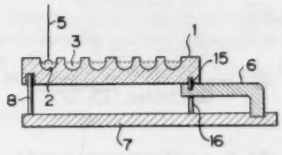
Toshio Sasaki, Tokyo, Japan, assignor to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,333

Claims priority, application Japan, May 25, 1976, 51-60282

Int. Cl.[2] G01N *1/18, 33/16;* B01F *11/00*

U.S. Cl. 23—259 **1 Claim**



1. In a serial dilution machine, the combination comprising:

a tray having a plurality of liquid receiving holes formed therein;

a horizontal support plate having a plurality of vertical props extending therefrom, said tray being slidably supported on said props;

a vertical pivot pin in an optional poition of said tray;

an L-shaped vibration rod having one end mounted to said pivot pin to rotationally couple said member to said tray;

said rod having another end pivotally mounted to said support plate for rotation about a vertical axis;

means for causing nonlinear rotational vibration of said member in a circular arc in only a horizontal plane with respect to said support plate to vibrate said tray via said pivot pin to thereby agitate any liquid within said holes; and

spring means coupled between a point of said rod adjacent said pivot pin and said support plate.

4,102,650

PROCESS FEED AND EFFLUENT TREATMENT SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 489,449, Jul. 17, 1974, Pat. No. 3,984,518, which is a continuation of Ser. No. 126,498, Mar. 22, 1971, abandoned. This application Feb. 13, 1976, Ser. No. 658,059

Int. Cl.[2] B01D *11/04*

U.S. Cl. 23—270.5 W **13 Claims**

1. Apparatus for treatment of the liquid water feed and effluent of a gas and liquid system in which system flows of hydrogen sulfide gas saturated with water vapor and of liquid water saturated with hydrogen sulfide are contacted at elevated temperature and pressure, said system having a feed liquid inlet for said liquid water feed, an effluent liquid outlet for said liquid effluent, a gas inlet, and a purge gas outlet through which a purge stream of said gas is discharged, said apparatus comprising:

(a) delivery means connected for delivering a stream of said water feed to said feed liquid inlet, and

(b) means connected in said delivery means upstream of said

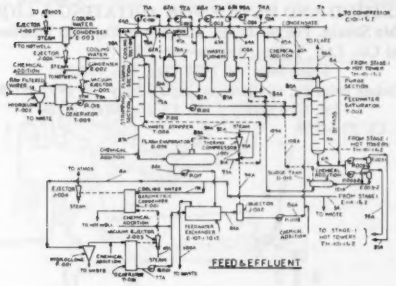
feed liquid inlet for treating said water feed prior to its introduction into said system, including:

(1) heat transfer means having a heating fluid inlet connected to said effluent liquid outlet, a cooled heating fluid outlet, a liquid water inlet connected in said delivery means to receive said liquid water feed for heating the same, and a liquid water outlet connected in said delivery means to pass heated feed liquid to said feed liquid inlet, for thereby heating said water feed by transferring heat thereto from said effluent as said effluent is cooled,

(2) a countercurrent gas and liquid direct contact means, for absorbing into said heated liquid water feed hydrogen sulfide from said purge stream, and having gas inlet and outlet passages and liquid inlet and outlet passages, and having its gas inlet passage connected to receive said purge stream from said purge gas outlet, its liquid outlet passage connected to said feed liquid inlet, and its liquid inlet passage connected to the heating fluid outlet of said heat transfer means, and

(3) liquid pressurizing means connected in said delivery means for supplying liquid water feed to said gas and liquid contact means at essentially said elevated pressure,

whereby said liquid water feed is heated to approach said elevated temperature and saturated with hydrogen sulfide at essentially said elevated temperature and pressure.



4,102,651

ULTRASONIC ATOMIZER FOR WASTE SULFURIC ACID AND USE THEREOF IN ACID CRACKING FURNACES

Walter Kerner, Hermulheim; Friedrich Mahler, Koln-Nippes, and Heinrich Peters, Lowenich, all of Fed. Rep. of Germany, assignors to DAVY POWERGAS GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 579,207, May 20, 1975, abandoned, Division of Ser. No. 405,908, Oct. 12, 1973, Pat. No. 3,908,904. This application Sep. 2, 1976, Ser. No. 719,973

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1972, 2250521; Nov. 17, 1972, 2256442

Int. Cl.[2] C01B *17/50;* **F27B** *15/02;* **F23D** *11/34*

U.S. Cl. 23—277 R **18 Claims**

1. A cracking furnace for waste sulfuric acid comprising:

a furnace chamber of substantially circular cross section having a ceiling and having a side wall;

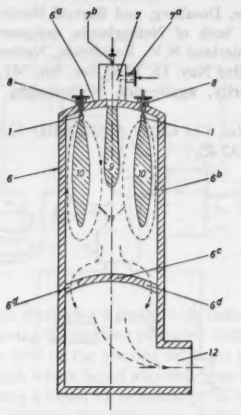
a burner centrally positioned in said ceiling;

a plurality of ultrasonic atomizer assemblies in said ceiling and distributed around said burner, each of said ultrasonic atomizer assemblies including:

(a) means for converting a feed stream of the waste sulfuric acid into a coarse spray, said means for converting including a cup in said assembly rotatable at a speed of about 4000 to 7000 rpm and means for forcing said feed stream against the inner surface of said cup, and

(b) means for generating a field of ultrasonic sound about said cup discharge and for further atomizing the coarse spray,

a gas flow constricting member transversing said chamber substantially perpendicular to the longitudinal axis thereof, located at a position from said ceiling at about 1–4 times the length of the diameter of said chamber below said burner,



outlet means at the bottom of said chamber below said gas flow constricting member, and

supply means for provision of fuel to said burner and second supply means for provision of said feed stream to said atomizer assemblies.

4,102,652

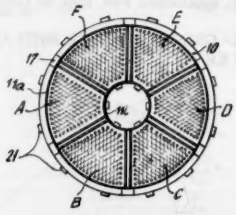
MODULAR CONSTRUCTION FOR A LARGE CATALYTIC REACTION APPARATUS

Rudolf Vogl, Deggendorf, Donau, Germany, assignor to Deggendorfer Werft und Eisenbau GmbH, Deggendorf, Donau, Germany

Filed Mar. 1, 1977, Ser. No. 773,161

Int. Cl.[2] B01J *8/06;* **B21D** *53/06;* **B23P** *15/26*

U.S. Cl. 23—288 M **7 Claims**



2. Large catalytic reaction apparatus comprising a first tube sheet and a second tube sheet, said first and second tube sheets spaced apart and disposed in substantially parallel relation, each said tube sheet divided into an equal number of similarly shaped sector-like sections, a plurality of tubes extending between and connected to each pair of one sector-like section of said first tube sheet and one sector-like section of each said second tube sheet, said tubes sealingly connected to said sector-like sections of said tube sheets, each said sector-like section of said first and second tube sheets comprising a pair of angularly spaced radially extending edges, an inner edge extending circumferentially between the radially inner ends of said radially extending edges, and an outer edge extending circumferentially between the radially outer ends of said radi-

ally extending edges, a radially extending side wall connected to and extending between each corresponding radially extending edge of said pair of said sector-like sections joined by the plurality of said tubes, a radially inner circumferentially extending side wall connected to and extending between the inner edges of said pair of sector-like sections joined by the plurality of said tubes, and a radially outer circumferentially extending side wall connected to and extending between the outer edges of said pair of sector-like sections, the adjacent edges of said radially extending side walls, inner side wall and outer side wall sealingly connected together and said radially extending side walls, inner side wall and outer side wall sealingly connected to said sector-like sections of said first and second tube sheets for forming a sealingly enclosed pressure tight modular unit and a circumferentially extending heat transfer medium inlet conduit and a circumferentially extending heat transfer medium outlet conduit connected to the radially outer face of said circumferentially extending radially outer side wall in each said modular unit and means for interconnecting said inlet conduits on adjacent said modular units and for interconnecting said outlet conduits on adjacent said modular units, whereby each said modular unit provides a sealingly closed pressure tight unit capable of being tested at a production site at operating pressures before it is shipped to and assembled at a construction site for assembly with the completed apparatus.

4,102,653

AROMATIC WOOD FUEL BRIQUETTE AND METHOD OF MAKING AND USING THE SAME

Charles T. Simmons, 2452 Dorchester, Troy, Mich. 48084 and William B. Lampert, III, Ypsilanti, Mich., assignors to Charles T. Simmons, Troy, Mich.

Continuation-in-part of Ser. No. 649,142, Jan. 14, 1976, abandoned. This application May 2, 1977, Ser. No. 793,189

Int. Cl.[2] C10L *5/12, 5/40, 5/00*

U.S. Cl. 44—16 R **6 Claims**

1. Smoke generating briquettes adapted to be used with a cooking heat source for generating aromatic smoke and vapors for smoking food during cooking with said heat source, said briquettes comprising: aromatic wood particles compressed with a combustion retardant binder into briquettes, said proportion of said combustion retardant binder being sufficient to produce self extinguishment of said briquettes in the absence of an external heat source to thereby prevent flaming by inhibiting combustion of emitted aromatic smoke and vapors, during substantially the entire combustion cycle of the briquettes, whereby, when subjected to the heat generated by said heat source, said briquettes will combust so as to generate said aromatic smoke and vapors over an extended time period and will not appreciably augment the heat generated by said heat source.

2. The articles of claim **1** in which the combustion retardant binder is chosen from the group consisting of alkali metal salts, ammonium salts, boric acid and phosphoric acids.

4,102,654

NEGATIVE IONIZER

Henri Maurice Pellin, Grenoble, France, assignor to Raymond Bommer, La Forteresse, France

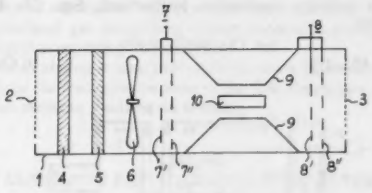
Filed Jul. 26, 1977, Ser. No. 819,117

Claims priority, application France, Jul. 27, 1976, 76 22831

Int. Cl.[2] B03C *3/38*

U.S. Cl. 55—102 **6 Claims**

1. In a negative ioniser of the kind which comprises an active filter, means to create a forced flow of air, at least one grid which is raised to a high positive potential and is intended to trap harmful negative ions, means for generating negative ions, and at least one grid which is raised to a high negative potential and is intended to trap any positive ions which may be present, the improvement which consists in that the said means for generating negative ions comprise a venturi which is raised to a high negative potential and which is made of polished metal, and within which, in its narrowest area, is arranged, coaxially



with the said venturi, a germicidal tube for generating short-wave ultraviolet radiation.

4,102,655

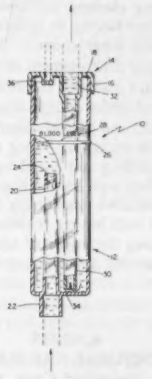
BUBBLE TRAP

Russell L. Jeffery, Littleton, Colo., and Lawrence V. Cote, Ronan, Mont., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed May 2, 1977, Ser. No. 792,793

Int. Cl.[2] A61M *1/03*

U.S. Cl. 55—201 **7 Claims**



1. A bubble trap for blood comprising:

a closed transparent container for holding blood,

said container having a top and a bottom and indicium constituting a blood level indicator,

an inlet tube into said container,

said inlet tube entering through said container bottom and extending upward within said container to an inlet opening and said inlet opening having a cross-sectional area smaller than the flow cross-sectional area of said container,

said inlet opening being spaced below said container top and below said indicium to direct gas bubbles toward said indicium,

an outlet tube from said container exiting through said container top,

said outlet tube extending downward into said container to an outlet opening,

said outlet opening being lower in said container than said inlet opening whereby blood flowing upward through said inlet opening into said container must subsequently flow downward to reach said outlet opening, and

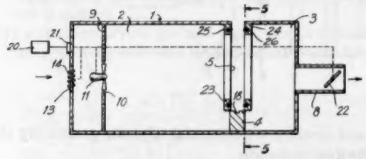
means positioned in the top of the container for removing gas from said container.

4,102,656

ODOR CONDITIONER

Bjorn R. Koritz, 1641 Third Ave., New York, N.Y. 10028

Filed Sep. 27, 1976, Ser. No. 726,721
Claims priority, application Switzerland, Sep. 25, 1975, 107516/75
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—210 10 Claims



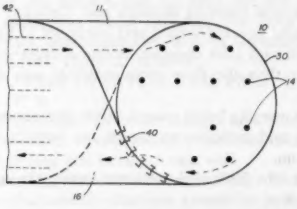
1. Apparatus for odor conditioning of ambient air by the introduction of a vapor of a selected liquid into a selected region or space, comprising a housing defining a chamber having an inlet end and an outlet end, a partition in said chamber, said partition having an opening therein, a first wall terminating said chamber at said inlet end, a second wall terminating said chamber at said outlet end, an electric fan for moving air from said inlet end to said outlet end, said fan being mounted in said opening in said partition, said housing having a slot therein dividing said chamber and separating said inlet from said outlet end, and a conditioning element for insertion fittingly in said slot, said conditioning element including a reservoir for said selected liquid, a frame having an opening therethrough and a wicking air-permeable filter element covering said opening, said frame holding said filter element and said reservoir so that said filter element dips into said reservoir and covers the slot between said inlet and outlet ends so that air moving from said inlet end to said outlet end of said chamber must pass through said filter element for accepting vapor of said selected liquid, said filter element holding said liquid by reason of its wicking characteristic, said first wall having therein a first opening for admitting air and first cover means for closing said first opening, and said second wall having therein a second opening for efflux of air containing the vapor of said selected liquid from said outlet end and second cover means for closing said second opening.

4,102,657

CENTRIFUGAL GAS SCRUBBER

Arun Kumar Mehta, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 9, 1977, Ser. No. 794,894
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—222 4 Claims



1. Contact structure within which gas to be treated is brought into contact with liquid which has the potential to remove contaminates from gas it contacts, including,

a source of gas containing contaminates to be removed,

a cylindrical housing extended vertically,

an inlet duct substantially rectangular in cross-section and connected through the side wall of the housing and to the source of gas and arranged and directed to flow the gas on the internal wall of the housing to initiate a circular flow path for the gas,

an outlet duct substantially rectangular in cross-section and connected through the side wall of the housing at a vertical elevation higher than the connection of the inlet duct and having a common wall with the inlet duct and flowing the gas from the upwardly spiralling flow path and into heat exchange relationship with the inlet gas through the common wall,

a volume within the housing and below the spiral gas path for liquid with which to remove contaminates from gas,

a body of liquid within the lower housing which has the potential to remove contaminates from gas,

nozzles positioned above the gas path within the housing and arranged and directed to discharge liquid into the gas path,

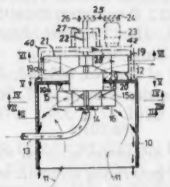
and conduit and pump means connecting the nozzles and body of liquid to supply the nozzles with liquid from the body.

4,102,658

APPARATUS FOR CONTACTING A GAS WITH A LIQUID

Viljo Juhana Jarvenpaa, Vellamontie 21 as 6, 04200 Kerava, Finland

Filed Aug. 17, 1976, Ser. No. 715,211
Claims priority, application Finland, Aug. 18, 1975, 752333
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—230 6 Claims



1. In a device wherein a gaseous fluid is brought into contact with a washing liquid for purposes such as removal of gaseous components and/or solid impurities from the gaseous fluid and/or cooling the gaseous fluid tubular receiving means for receiving the gaseous fluid and including means for placing the latter in contact with a washing liquid in the interior of said tubular receiving means, said tubular receiving means having an inlet through which the gaseous fluid enters into said tubular receiving means, and said tubular receiving means including an outer tubular wall and an end wall fixed to and extending across said outer tubular wall distant from said inlet and formed with an opening which passes through said end wall, said tubular receiving means placing said gaseous fluid in contact with the washing liquid as said gaseous fluid flows toward said end wall so that the gaseous fluid is in a wetted condition when reaching the region of said end wall, internal radial blower means situated in said tubular receiving means adjacent said end wall thereof for separating droplets from the wetted gaseous fluid in said tubular receiving means, external radial blower means situated outside of said tubular receiving means adjacent said end wall thereof for providing a flow of purified gas radially from said external blower means, said external blower means being coaxial with and having a diameter greater than that of said internal blower means, and both of said blower means having central suction regions while a common axis of both of said blower means is substantially perpendicular to said end wall, and connecting tubular means fluid-tightly connected with both of said blower means and passing through said opening in said end wall of said tubular receiving means, said connecting tubular means having a hollow interior communicating fluid-tightly with the interiors of both of said blower means at said central suction regions

thereof, so that gas from which droplets have been removed by said internal blower means flows from the latter through said connecting tubular means to said external blower means to be radially discharged thereby, said internal and external radial blower means respectively including outer end plates which are distant from each other and inner end plates which are situated between and spaced from said outer end plates, with said end wall of said tubular receiving means extending between said inner end plates and surrounding said connecting tubular means, each of said blower means including a plurality of blower vanes extending between and fixed to said inner and outer end plates thereof, said inner end plates of both of said blower means respectively being formed with central openings respectively situated at said central suction regions thereof, and said connecting tubular means being coaxial with said internal and external blower means while extending between and being fixed to said inner end plates for providing communication between said internal and external blower means from said central opening of said inner end plate of said internal blower means, through said connecting tubular means, and into said external blower means through said central opening of said inner end plate thereof, whereby said internal and external blower means and said connecting tubular means form a single rotary unit through which the gaseous fluid flows while being confined therein without being required to travel with respect to any surfaces with respect to which said unit rotates, and drive means operatively connected to said unit for rotating the latter about said axis.

4,102,659

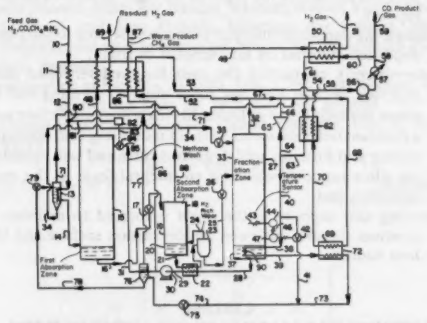
SEPARATION OF H_2, CO, AND CH_4 SYNTHESIS GAS WITH METHANE WASH

Jay Robert Martin, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 692,749, Jun. 4, 1976, abandoned. This application Oct. 6, 1976, Ser. No. 730,287

Int. Cl.² F25J *3/02*

U.S. Cl. 62—17 **28 Claims**



1. A process for the separation of a feed gas mixture containing hydrogen, carbon monoxide and methane comprising the steps of:

(a) cooling the feed gas mixture;

(b) countercurrently contacting the cooled feed gas mixture with a methane wash liquid in a first absorption zone to recover hydrogen gas as overhead and bottoms liquid comprising methane, carbon monoxide and residual hydrogen;

(c) throttling the bottoms liquid from the first absorption zone to lower pressure;

(d) countercurrently contacting the throttled bottoms liquid with hydrogen rich vapor in a second absorption zone for absorption of carbon monoxide from the hydrogen rich vapor by the throttled bottoms liquid therein to recover residual hydrogen gas as overhead and bottoms liquid enriched in carbon monoxide, and warming second absorption zone bottoms liquid to vaporize a gaseous fraction therefrom containing hydrogen and carbon monoxide, as said hydrogen rich vapor for said second absorption zone;

(e) fractionating the bottoms liquid recovered from said second absorption zone in a fractionation zone to recover overhead gas comprising carbon monoxide and bottoms liquid comprising methane; and

(f) recirculating at least part of the bottoms liquid recovered from the fractionation zone to the first absorption zone as the methane wash liquid therefor.

4,102,660

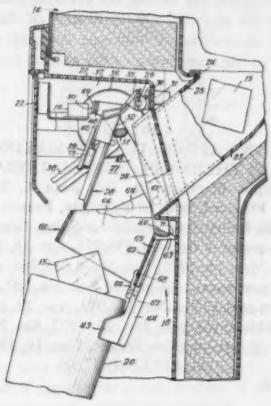
ICE GUIDE FOR REFRIGERATOR WITH EXTERNAL ICE SERVICE

Leo Gano Beckett, Henderson, Ky., and William J. Buchser, Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 26, 1976, Ser. No. 718,144

Int. Cl.² F25C *1/00*

U.S. Cl. 62—344 **18 Claims**



1. In an ice dispensing apparatus having a wall provided with an opening, apparatus for delivering ice pieces outwardly through said opening, and actuating means carried by the wall for selectively actuating said apparatus, the improvement comprising:

closure means for selectively closing said opening;

guide means; and

means for selectively positioning said closure means and said guide means separately of one another to cooperatively define directing means for directing the ice pieces away from said opening to a preselected delivery area concurrently with operation of said actuating means.

4,102,661

CAUSTIC RAY USE OF THE DRAWDOWN ZONE OF AN OPTICAL FIBER PREFORM TO CONTROL THE DRAWING OF THE FIBER

Thomas Dixon Dudderar, Meyersville, and Peter Gerald Simpkins, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1977, Ser. No. 774,139

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **12 Claims**

1. A method of fabricating an optical fiber comprising:

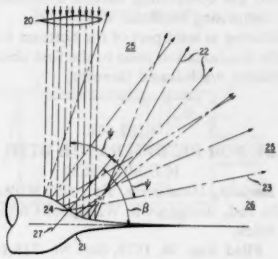
heating a portion of an optical fiber preform thereby softening it sufficiently so as to enable drawing;

drawing the optical fiber preform into an optical fiber while controlling one or more drawing parameters;

illuminating the optical fiber preform during the drawing

process to yield at least one caustic ray emanating from the curved region of the drawdown zone;

detecting the at least one caustic ray emanating from the curved region of the drawdown zone;



monitoring variations in the propagation direction of the at least one caustic ray during the drawing process; and

controlling the physical characteristics of the drawdown zone, by controlling at least one drawing parameter in response to the monitoring of the at least one caustic ray.

4,102,662

METHOD AND APPARATUS FOR MAKING FIBERS FROM THERMOPLASTIC MATERIALS

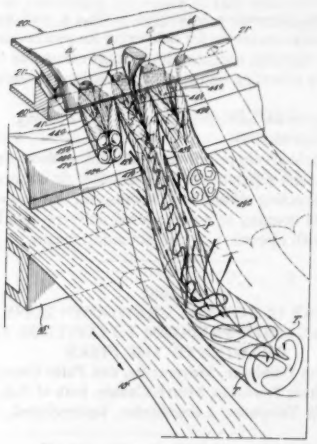
Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 676,755, Apr. 14, 1976, and Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, said Ser. No. 676,755, continuation-in-part of Ser. No. 557,282, is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Jan. 25, 1977, Ser. No. 762,789

Claims priority, application France, Dec. 16, 1976, 76 37884

Int. Cl.[2] C03B *37/06*

U.S. Cl. 65—5 **42 Claims**



4. A method for forming fibers from attenuable material comprising establishing a series of spaced gaseous jets directed in side by side paths, deflecting the jets from said paths to alter the paths thereof and to cause lateral spreading of the jets, the jets being sufficiently close to each other to provide for impingement of adjoining deflected jets upon each other in zones intermediate the jets and thereby generate spaced tornadoes, and delivering a stream of attenuable material into the influence of each jet in a region along the path thereof between said tornadoes.

4,102,663

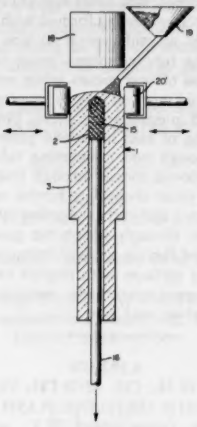
METHOD FOR MANUFACTURING HOLLOW AND SOLID INGOTS

Lothar Jung, 31 Lurline Dr., Millington, N.J. 07946

Filed Jul. 9, 1976, Ser. No. 703,919

Int. Cl.[2] C03B *23/20, 37/02*

U.S. Cl. 65—18 **15 Claims**



1. A method for forming a cylindrical silica ingot from a silica melt comprising:

depositing silica initially onto the surface of a linearly movable cylindrical support of said silica and subsequently onto the surface of the ingot as the ingot is formed on said support;

heating the deposited material with a heat source to melt said deposited material on said support or ingot;

intermittently contacting the melt for predetermined time intervals, with at least one roller member forming tool to shape the melt into a cylinder having a smooth surface and a constant outer diameter without increasing said diameter during said forming, said deposited silica and said cylindrical silica support becoming an integral form as the melt solidifies; and

moving said support as the ingot is formed to maintain a constant distance between the deposition surface and the heat source.

4,102,664

METHOD FOR MAKING GLASS ARTICLES WITH DEFECT-FREE SURFACES

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 18, 1977, Ser. No. 798,022

Int. Cl.[2] C03C *19/00, 25/02*

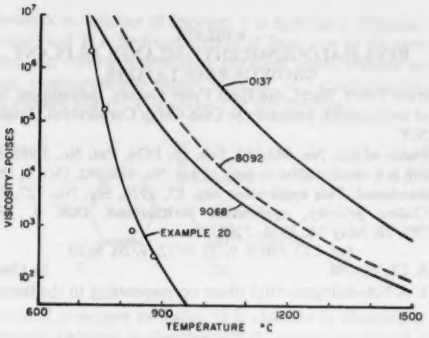
U.S. Cl. 65—23 **4 Claims**

1. A method for forming strengthened glass articles having surfaces which are essentially defect free and equivalent in smoothness to polished surfaces which comprises the steps:

(a) two glass-forming batches of different compositions are melted, one batch for a glass which is highly soluble in a given solvent and the second for a glass which is relatively insoluble in the same solvent;

(b) the molten batches are simultaneously brought together while in the fluid state, that is, having viscosities no greater than about 250,000 poises, to form a laminated glass body wherein the insoluble glass is essentially completely enclosed within the soluble glass;

(c) the laminae are fused together at a temperature where the melts are in fluid form to provide an interface therebetween which is defect free and to cause an exchange of ions to take place at said interface between said insoluble glass and said soluble glass, the composition of the soluble glass being selected such that there is essentially no composition gradient at said interface but the migratable ions thereof enhance the chemical durability of the insoluble



glass and cause the production of a surface layer on the insoluble glass having a coefficient of thermal expansion lower than that of the insoluble glass, and the composition of the insoluble glass being selected such that the migratable ions thereof enhance the solubility of the soluble glass;

(d) the laminated article is cooled; and then

(e) the soluble glass layer is dissolved away in a solvent wherein it is at least 10 times more soluble than the insoluble glass.

4,102,665

DIFFUSION TREATMENTS FOR MODIFYING THE PROPERTIES OF GLASS AND VITROCRYSTALLINE MATERIALS

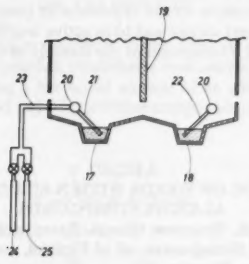
Emile Plumat, Gilly; Pol Baudin, Ransart; Robert Van Laethem, Loverval, and Jean Deliere, Montigny sur Sambre, all of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Continuation of Ser. No. 111,493, Feb. 1, 1971, abandoned. This application May 28, 1976, Ser. No. 691,064

Claims priority, application United Kingdom, Feb. 3, 1970, 5123/70

Int. Cl.² C03C *21/00*

U.S. Cl. 65—30 E **16 Claims**



1. In a process for chemically tempering at least part of a body of glass or vitrocrystalline material by diffusing ions into at least part of the body from a contacting medium composed of at least one molten metal salt and constituting a source of such ions, the body being disposed in an enclosure for the chemical tempering operation, the improvement comprising providing at least one pool of the medium within said enclosure, said pool being out of contact with and below the body bubbling gas through the pool in order to agitate the medium in the pool sufficiently to place said medium in the form of a mist composed of liquid droplets of such molten salt, which mist fills the enclosure and contacts the body; and continuously replenishing the medium contacting the body.

4,102,666

METHOD OF SURFACE CRYSTALLIZING QUARTZ

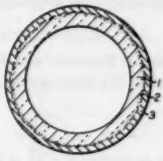
Peter Bäumler, Dörnigheim; Gerhard Höfer, Bruchköbel; Tassilo Körner, Erlensee; Heinrich Mohn, Hailer; Karl Seiler, Hanau-Hohe Tanne; Fritz Simmat, Meerholz, and Karlheinz Rau, Hanau, all of Fed. Rep. of Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Division of Ser. No. 383,432, Jul. 27, 1973, Pat. No. 3,927,697, which is a division of Ser. No. 166,844, Jul. 28, 1971, Pat. No. 3,776,809, which is a continuation of Ser. No. 793,755, Jan. 24, 1969, abandoned, and Ser. No. 810,713, Mar. 26, 1969, abandoned. This application Sep. 25, 1975, Ser. No. 616,522

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1968, 1696061; Mar. 30, 1968, 1771077; Mar. 30, 1968, 1988697

Int. Cl.² C03C *21/00*

U.S. Cl. 65—33 **10 Claims**



1. Process for making a fused quartz glass tube capable of forming an outer layer of uniformly fine crystalline silica when heated to a temperature at which such crystalline silica forms which comprises forming a first tube from fused quartz glass *containing a crystallization promoting nuclei whose rate of diffusion in quartz glass is* less than that of sodium at elevated temperatures, inserting a second, snugly fitting fused quartz glass tube into said first tube and thereafter fusing said first and second tubes together at a temperature of at least 1200°C wherein the fused quartz glass recrystallizes.

4,102,667

ADDITIVE AND METHOD FOR REDUCING THE DRIFT OF AQUEOUS SPRAY COMPOSITIONS

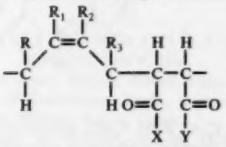
Robert Earl Robinson, Columbia, and John Alan Ernst, Lexington, both of S.C., assignors to Lindau Chemicals, Inc., Columbia, S.C.

Filed Jul. 16, 1976, Ser. No. 706,043

Int. Cl.² C08L *9/00*

U.S. Cl. 71—3 **13 Claims**

1. A method for depositing an aqueous composition in a well defined pattern in an area on the ground from above the ground comprising the steps of providing a mixture of said aqueous composition and a drift-inhibiting amount of a substantially water-soluble copolymer of maleic acid and a conjugated diene, said copolymer having the structural formula



wherein R, R_1, R_2, and R_3 are members selected from the group consisting of hydrogen, halogen, aryl radicals and alkyl, cycloalkyl and alkoxy radicals having from 1 to 8 carbon atoms and wherein R, R_1, R_2, and R_3 are the same or different and wherein at least 75% of the carbon-to-carbon double bond structure is cis-1,4; and wherein X and Y are OZ and wherein Z is hydrogen, an alkali or alkaline earth metal, or an ammonium radical and wherein Z is the same or different; and dis-

pensing the resulting admixture as aqueous droplets into the air above said area, said copolymer reducing drift of said aqueous droplets by increasing the droplet size.

4,102,668

β-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

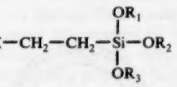
Division of Ser. No. 443,180, Feb. 15, 1974, Pat. No. 3,985,780, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Sep. 27, 1976, Ser. No. 727,313

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

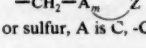
Int. Cl.[2] A01N *9/00, 9/12*

U.S. Cl. 71—90 **7 Claims**

1. A beta-halogen-ethyl silane corresponding to the formula



wherein X is chlorine or bromine, and R_1, R_2 and R_3 are the same and correspond to the heterocycle



wherein Z is oxygen or sulfur, A is C, -CH= or $-CH_2-$, and m is the integer 4 or 5.

7. A composition for the regulation of plant growth comprising a) an inert carrier and b) an active ingredient, an effective amount of a compound of the formula of claim 1.

4,102,669

HERBICIDAL BETA-PHENYL-4-PIPERIDINONES AND -DIHYDROPYRIDINONES

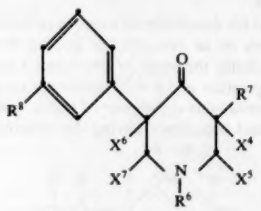
Harold Mellon Taylor, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 685,409, May 20, 1976, Pat. No. 4,065,290, and a continuation-in-part of Ser. No. 593,095, Jul. 3, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,616

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—94 **37 Claims**

1. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with an herbicidally-effective amount of a compound of the formula



wherein

R^6 represents C_1-C_3 alkyl, C_2-C_3 alkenyl or propargyl;

R^7 represents hydrogen, phenoxy, phenylthio, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 alkylthio, phenyl or phenyl monosubstituted with chloro, bromo, fluoro, trifluoromethyl, C_1-C_3 alkyl or C_1-C_3 alkoxy;

R^8 represents chloro, bromo, fluoro, trifluoromethyl, C_1-C_3 alkyl or C_1-C_3 alkoxy;

each of X^4 and X^5 represents hydrogen, or X^4 and X^5 combine to form a carbon-carbon bond;

each of X^6 and X^7 represents hydrogen, or X^6 and X^7 combine to form a carbon-carbon bond;

provided that at least one of (X^4 and X^5) and (X^6 and X^7) form a bond.

4,102,670

BETA-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

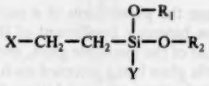
Division of Ser. No. 443,180, Feb. 15, 1974, Pat. No. 3,985,780, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Sep. 27, 1976, Ser. No. 727,303

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

Int. Cl.[2] A01N *9/00, 9/12, 9/20, 9/24*

U.S. Cl. 71—98 **21 Claims**

1. A beta-halogen-ethyl silane corresponding to the formula



wherein

X represents chlorine or bromine, Y represents chlorine or the radical $-OR_3$; R_1, R_2 and R_3 represent, independently of each other, alkyl radicals having 6 to 18 carbon atoms; alkyl radicals substituted by halogen, alkenyloxy, phenoxy, cycloalkyl, alkylthio, alkoxycarbonyl, or di- and trialkylammonio, alkenyl or halogenalkenyl; alkynyl; cycloalkyl; phenyl radicals optionally mono- or polysubstituted by cyano, alkyl, halogenalkyl, alkoxy alkylthio, or alkoxycarbonyl; benzyl radicals optionally mono- or polysubstituted by alkyl, alkoxy or halogen; one or more of the symbols R_1, R_2 and R_3 can also represent the group $-CO-R_4$ wherein R_4 stands for C_6—C_{18} alkyl, alkenyl or alkynyl radical; a halogenalkyl or halogenalkenyl radical; an alkyl or alkenyl radical substituted by cycloalkyl or phenyl, whereby phenyl can be substituted by alkyl, alkoxy or halogen; an alkoxyalkyl; an alkoxycarbonylalkyl; a phenyl radical optionally substituted by halogen, lower alkyl or lower alkoxy.

17. A composition for the regulation of plant growth comprising a) an inert carrier and b) as active ingredient, an effective amount of a compound of the formula of claim 1.

4,102,671

CONTROL OF WEEDS WITH N-SUBSTITUTED ALANINE COMPOUNDS

Ernest Haddock, Sheerness; Clive A. Raven, and Alan J. Sampson, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

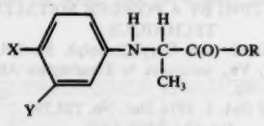
Division of Ser. No. 709,756, Jul. 29, 1976. This application Jul. 25, 1977, Ser. No. 819,014

Claims priority, application United Kingdom, Jul. 29, 1975, 31691/75

Int. Cl.[2] A01N *9/12, 9/20*

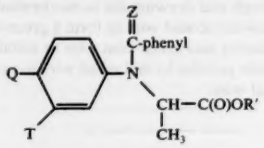
U.S. Cl. 71—98 **4 Claims**

1. A herbicidally active composition which comprises a carrier, optionally a surface-active agent, and as active ingredients: (a) a compound of the formula:



(I)

wherein X is chlorine of fluorine, Y is hydrogen, chlorine, or fluorine, and R is hydrogen, alkyl of from one to six carbon atoms, and when R is hydrogen, the alkali metal, alkaline earth metal, ammonium and mono- and di(C_1–C_6–alkyl)ammonium salts thereof and (b) a compound of the formula:



(II)

wherein Z is oxygen or sulfur, Q is chlorine or fluorine, T is hydrogen, chlorine or fluorine and R′ represents one of the moieties represented by the symbol R, the weight ratio of the compound of formula (I) to the compound of formula (II) being within the range of from about 4:1 to about 1:2.

4,102,672
HERBICIDAL COMPOSITION OF AMINO ACID HIGHER ALKYL ESTER TYPE AND METHOD FOR CONTROLLING WEEDS

Takao Kida, Yokosuka; Hiroshi Mizuno, Yokohama, and Masaru Okutsu, Kawasaki, all of Japan, assignors to Ajinomoto Co. Inc., Tokyo, Japan

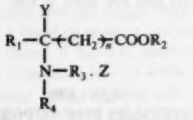
Division of Ser. No. 514,745, Oct. 15, 1974. This application Jul. 6, 1976, Ser. No. 702,501

Claims priority, application Japan, Oct. 19, 1973, 48-118316; Feb. 14, 1974, 49-18050

Int. Cl.² A01N *9/02*

U.S. Cl. 71—106 **14 Claims**

1. A herbicidal composition in the form of dust, granule, pellet, wettable powder, emulsifiable concentrate, or dispersed liquid comprising a herbicidal amount of an admixture of an active compound (A) selected from compounds of the formula



wherein R_1 is a hydrogen atom or alkyl of 1 to 4 carbon atoms, R_2 is an alkyl of 8 to 18 carbon atoms, each of Y, R_3 and R_4 is independently a member selected from the group consisting of a hydrogen atom or methyl group, Z is an inorganic or organic acid group selected from the group consisting of hydrochloric acid, oxalic acid and pyroglutamic acid, and *n* is 0, 1 or 2 and (B) 3,3′-dimethyl-4-methoxybenzophenone and a diluent or carrier wherein the weight ratio of (A) to (B) is 2:8 to 8:2.

4,102,673
1-PHENYL-HEXYL UREAS AS HERBICIDES

George A. Buntin, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 155,340, Jun. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 756,424, Aug. 30, 1968, abandoned. This application Feb. 28, 1973, Ser. No. 336,600

Int. Cl.² A01N *9/20;* **C07C** *127/15, 127/19*

U.S. Cl. 71—120 **12 Claims**

1. A herbicidal composition comprising application aid material and an effective quantity of 1-phenyl-3-(2-hexyl)urea.

4,102,674
METHOD FOR HARDENING IRON ORE PELLETS

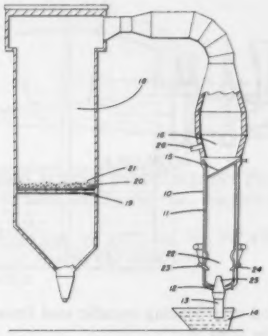
Kurt Osterloh; Karl Peter; Paul Gernhardt, all of Bochum; Wolfgang Grams, Herne; Christian Hundeshagen, Bochum; Wilhelm Danguillier, Bochum, and Siegfried Pohl, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,262

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608003

Int. Cl.² C22B *1/14*

U.S. Cl. 75—3 **7 Claims**



1. A process for hardening iron ore pellets, said process including the steps of:

generating low calorific gas in a gasification chamber of a slag bath generator,

extracting liquid slag from the stream of low calorific gas produced by the slag bath generator after passing from said gasification chamber,

thereafter heat treating the low calorific gas by admixture with air in a mixing chamber, and

contacting iron ore pellets in a treatment chamber with the heat treated, low calorific gas to harden the iron ore pellets.

4,102,675
METHOD OF TREATING MOLTEN SLAGS IN STEEL MAKING PROCESS

Yoshio Miyashita; Akira Masui; Kenzo Yamada, and Kenji Takahashi, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 676,937, Apr. 14, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,272

Claims priority, application Japan, Apr. 16, 1975, 50/45301

Int. Cl.² C21B *3/04*

U.S. Cl. 75—24 **5 Claims**

1. A process of changing the composition of molten slag, comprising the steps of

(A) tapping molten steel from a converter to separate said molten steel from molten slag thereby substantially leav-

ing molten slag remaining therein, said slag comprising CaO, SiO_2, MgO, MnO, FeO, and P_2O_5;

(B) adding solid carbon and flux to said molten slag remaining in said converter;

(C) blowing oxygen onto said carbon and flux on the surface of said molten slag to generate exothermic reaction and compensate for heat loss caused by said addition of carbon and flux without addition of any external heat, whereby said molten slag is regenerated to increase the amount of said CaO, SiO_2, MgO and to decrease the amount of MnO, Fe and P_2O_5; and

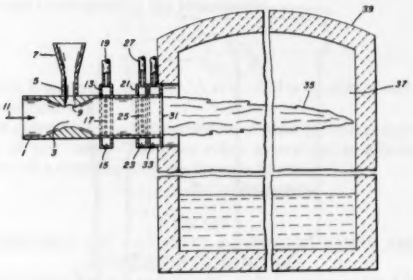
(D) removing said regenerated slag from said converter and thereby to prepare said converter for another steel making charge.

4,102,676

METHOD FOR RECOVERING LEAD FROM BATTERY MUD

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,112
Int. Cl.² C22B *13/02*
U.S. Cl. 75—77 **3 Claims**



1. A method of producing metallic lead from battery mud comprising the steps of:

drying the battery mud to produce a fine particulate material;

entraining the fine particulate material in a stream of air;

injecting a reducing gas into the stream of air and fine particulate material around the periphery thereof to produce a reducing flame;

injecting oxygen into the fuel rich periphery of the stream of air and fine particulate material in sufficient quantity to ensure a stable flame and to maintain reducing temperature; and

collecting the droplets of lead which fall from the reducing flame.

4,102,677

AUSTENITIC STAINLESS STEEL

Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 2, 1976, Ser. No. 746,972
Int. Cl.² C22C *38/44*
U.S. Cl. 75—128 A **10 Claims**

1. A hot workable, pitting and crevice corrosion resistant austenitic stainless steel, consisting essentially of, by weight, from 18 to 20% chromium, 11 to 14% nickel, 3.25 to 3.75% molybdenum, up to 2% manganese, up to 0.01% sulfur, from 0.015 to 0.1% of at least one element from the group consisting of cerium, calcium and magnesium, nitrogen from 0.1% up to about 0.3%, up to 0.08% carbon, up to 1% silicon, up to 1% columbium, up to 0.3% vanadium, up to 0.3% titanium, balance essentially iron.

4,102,678

METAL COATING BY A POWDER METALLURGY TECHNIQUE

David Olen Gothard, and Gary Rudolph Strobel, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Oct. 1, 1976, Ser. No. 728,780
Int. Cl.² B22F *3/00*
U.S. Cl. 427—191 **8 Claims**

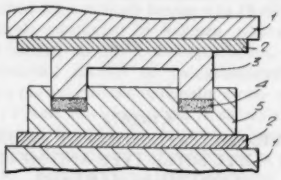
1. A process for producing a metal coated metal wire comprising: passing a metal wire through a coating material consisting of a metal flake powder located adjacent a drawing die, said metal flake powder characterized by an elongate flat shape; drawing said metal wire while in contact with said metal flake powder through said drawing die to mechanically adhere said metal flake powder to said wire to form a green-coat wire; and thereafter sintering said green-coat wire to metallurgically bond said metal flake powder to said metal wire to provide said metal coated metal wire.

4,102,679

POWDER METALLURGIC MANUFACTURING PROCESS

Aukusti Arvela, Helsinki, Finland, assignor to L.A. Levanto Oy, Pikkulinnunreitti, Finland

Filed Dec. 6, 1976, Ser. No. 747,925
Claims priority, application Finland, Dec. 23, 1975, 753648
Int. Cl.² B22F *3/14*; H05B *3/60*
U.S. Cl. 75—226 **4 Claims**



1. In a powder metallurgical manufacturing process, where metal powder or a metal powder mixture is compressed and heated in a mould and the mould and the metal powder are cold at the beginning of the process and where heat is produced by conducting electric current through the mould and the metal powder as well as through at least one electrically resistive fireproof body in outer contact with the mould, in which body the heat thus produced is transferred into the mould and into the metal powder the improvement wherein:

(a) the electric tension is between 2 and 200 V;

(b) the current efficiency per unit volume of the mould is between 20 and 200 W/cm^3; and

(c) the resistivity of the electrically resistive fireproof body is between 0.03 and 100 ohm × cm.

4,102,680

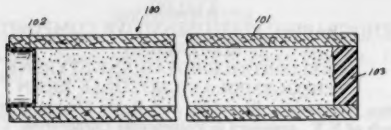
DEVICE AND METHOD FOR SUPPRESSING ACTIVE SLAG

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Continuation-in-part of Ser. No. 639,469, Dec. 10, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,916
Int. Cl.² C04B *7/14*
U.S. Cl. 75—257 **15 Claims**

1. A method which comprises filling a hollow burnable cellulosic body with a mixture of silaceous sand, elemental sulfur and sodium chloride, confining this mixture in the body

to provide a unitary device, and then immersing the device into a layer of active slag on a body of molten material



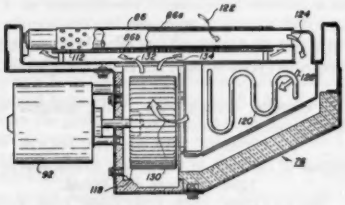
whereby to release gases from the slag and thereby quell the activity of the slag.

4,102,681

TRANSFER AND FUSING METHOD

Vaidevutis C. Draugelis; George N. Tsilibes, and John E. Vineski, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 300,531, Oct. 25, 1972, Pat. No. 3,826,892. This application Mar. 28, 1974, Ser. No. 455,701
Int. Cl.² G03G *13/20, 13/22*
U.S. Cl. 96—1.4 **3 Claims**



1. A method of electrophotographic printing including the steps of:

charging a photoconductive surface to a substantially uniform potential;

projecting a light image of an original document to be reproduced onto the photoconducive surface to record an electrostatic latent image thereon;

developing the electrostatic latent image with toner particles to create a toner powder image adhering electrostatically to the photoconductive surface;

transferring the toner powder image from the photoconductive surface to a sheet of support material;

transporting the sheet of support material with the toner powder image deposited on one surface thereof along a path of movement on an endless belt arranged to be in substantial contact with the other surface of the support material;

heating the surface of the endless belt contacting the support material;

energizing a radiant energy supply in response to a sheet of support material being positioned on the endless belt; and

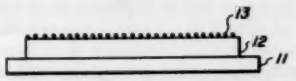
controlling the radiant energy supply at a lower power level above a predetermined temperature, and a higher power level below the predetermined temperature.

4,102,682

IMAGING MEMBER

William L. Goffe, Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 572,762, Apr. 29, 1975, abandoned, which is a division of Ser. No. 181,990, Sep. 20, 1971, Pat. No. 3,933,491, which is a continuation-in-part of Ser. No. 837,591, Jun. 30, 1969, Pat. No. 4,013,462, and Ser. No. 837,592, Jun. 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,837, May 31, 1966, abandoned. This application Jul. 19, 1976, Ser. No. 706,319
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 R **4 Claims**



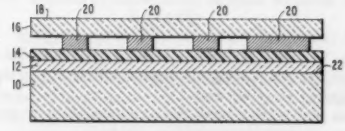
1. An imaging member comprising a fracturable layer comprising migration material, wherein said fracturable layer is contiguous the surface of and at least partially embedded in and contacting one surface of a softenable layer comprising homogeneous photoconductive softenable material whereby said migration material is spaced apart from the opposite surface of said softenable layer.

4,102,683

NONREFLECTING PHOTORESIST PROCESS

James John DiPiazza, Mt. Laurel, N.J., assignor to RCA Corp., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,479
Int. Cl.² G03C *5/00*
U.S. Cl. 96—38.4 **1 Claim**



1. An improved photolithographic method for defining a pattern of a photoresist layer which overlies a material, said photoresist layer being sensitive to light of a particular peak wavelength, the method being of the type which includes the step of exposing said photosensitive layer to a pattern of light having a frequency distribution which includes said peak wavelength, wherein the improvement comprises:

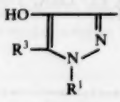
applying a light absorbing layer comprising a fluorescent dye selected to absorb light of said particular peak wavelength and to emit light of a different wavelength which said photoresist layer is not sensitive to between said material and said photoresist layer prior to said step of exposing whereby light of said particular peak wavelength which passes through said photoresist layer during said step of exposing will be absorbed by said light absorbing layer and not reflected back into said photoresist layer.

4,102,684
4-HYDROXYPYRAZOLE DEVELOPING AGENTS

Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 671,741, Mar. 30, 1976, Pat. No. 4,049,450.
This application Aug. 1, 1977, Ser. No. 820,761
Int. Cl.[2] G03C 5/38, 5/30
U.S. Cl. 96—61 M 9 Claims

1. A photographic developer composition comprising an aqueous alkaline solution containing a silver halide developing agent of the formula



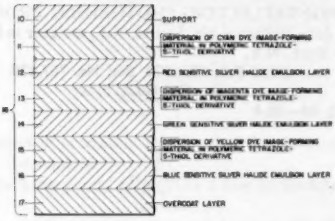
wherein R^1 is selected from hydrogen and hydroxy and R^2 and R^3 each is selected from phenyl, 2-thienyl and alkyl and a film-forming thickening agent.

9. A developer composition as defined in claim 1 which includes a silver halide solvent.

4,102,685
PHOTOGRAPHIC USES OF POLYVINYLPHENYLMERCAPTO-TETRAZOLE:MULTIVALENT METAL CATION COMBINATIONS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 26, 1976, Ser. No. 718,043
Int. Cl.[2] G03C 1/40, 1/76, 1/48, 1/72
U.S. Cl. 96—73 68 Claims

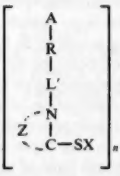

SUPPORT
RED SENSITIVE SILVER HALIDE EMULSION LAYER
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER
OVERCOAT LAYER

1. A diffusion transfer photosensitive element which comprises

(a) a support layer;

(b) at least two selectively sensitized silver halide emulsion layers each having associated therewith a dye image-forming material; and

(c) an interlayer intermediate said emulsion layers comprising a compound Serial No. 718,043



wherein A is an ethylenically unsaturated group which has been polymerized, R is a resonance stabilized group, L′ is an optional linking group, X is alkali metal or primary, secondary, tertiary or quaternary ammonium, Z represents the atoms and bonds necessary to complete a 1, 2, 3, 4-tetrazole ring and *n* is an integer of at least 100; and

(d) a multivalent metal cation located in said interlayer in a sufficient concentration to increase the permeability of said interlayer to said dye image-forming material.

4,102,686
LITHOGRAPHIC PHOTOSENSITIVE COMPOSITIONS COMPRISING ACRYLONITRILE-BUTADIENE-STYRENE TERPOLYMER AND NOVOLAK RESIN

Lester Weinberger, Riverdale, and Robin Daskin, Levittown, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,054
Int. Cl.[2] G03C 1/52
U.S. Cl. 96—91 R 13 Claims

1. A photosensitive composition which comprises the mixture of an acrylonitrile-butadiene-styrene terpolymer with a novolak resin and a lithographically suitable photosensitizer wherein the proportion of acrylonitrile-butadiene-styrene terpolymer in the blend of the acrylonitrile-butadiene-styrene terpolymer with the novolak resin is in the range of from 1% to 7% by weight and wherein the proportion of photosensitizer in the mixture of the photosensitizer with the acrylonitrile-butadiene-styrene blend with said novolak resin is in the range of from 20% to 70%.

4. A lithographic printing plate which comprises a metal sheet substrate having coated thereon a photosensitive composition which comprises the mixture of an acrylonitrile-butadiene-styrene terpolymer with a novolak resin and a lithographically suitable photosensitizer wherein the proportion of acrylonitrile-butadiene-styrene terpolymer in the blend of the acrylonitrile-butadiene-styrene terpolymer with the novolak resin is in the range of from 1% to 7% by weight and wherein the proportion of photosensitizer in the mixture of the photosensitizer with the acrylonitrile-butadiene-styrene blend with said novolak resin is in the range of from 20% to 70%.

4,102,687
UV CURABLE COMPOSITION OF A THERMOSETTING CONDENSATION RESIN AND GROUP VIA ONIUM SALT

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,074
The portion of the term of this patent subsequent to Nov. 11, 1994, has been disclaimed.
Int. Cl.[2] G03C 1/68, 5/00; G08F 2/46, 4/00
U.S. Cl. 96—115 R 7 Claims

1. UV curable organic resin compositions consisting essentially of

(1) a thermosetting organic condensation resin of formaldehyde and a member selected from the class consisting of urea, phenol and melamine,

(2) an effective amount of a Group VI*a* onium salt of the formula,

$$[(R)_a(R^1)_b(R^2)_cX]_d^+[MQ_e]^{-(e-f)},$$

and

(3) from 0 to 5 parts of filler per part of said thermosetting organic condensation resin,

where R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VI*a* element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, *a* is a whole number equal to 0 to 3 inclusive, *b* is a whole number equal to 0 to 2 inclusive, *c* is a whole number equal to 0 or 1, where the sum of $a + b + c$ is a value equal to 3 or the valence of X, $d = e - f$

f = valence of M and is an integer equal to from 2 to 7 inclusive

e is >*f* and is an integer having a value up to 8.

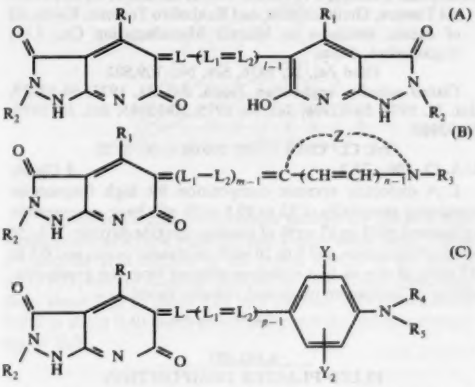
4,102,688

METHINE DYES

Masatoshi Sugiyama; Hirosi Sawaguchi, and Akio Mitsui, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed May 9, 1977, Ser. No. 795,041
Claims priority, application Japan, May 10, 1976, 51-52994
Int. Cl.[2] G03C *1/14, 1/22*
U.S. Cl. 96—139 24 Claims

1. A methine dye represented by the following general formula (A), (B) or (C):



wherein R_1 represents an alkyl group, an aralkyl group, an aryl group, a 5- or 6-membered heterocyclic residue, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or an amino group; R_2, R_3, R_4 and R_5, which may be the same or different, each represents an alkyl group, an aralkyl group, an aryl group or a 5- or 6-membered heterocyclic residue; said 5- or 6-membered heterocyclic residue for R_1, R_2, R_3, R_4 and R_5 selected from the group consisting of a pyridyl group, a quinolinyl group, a benzoxazolyl group, a thiazolyl group, a benzothiazolyl group, an oxazolyl group or a selenazolyl group; and R_2 may additionally represent a hydrogen atom; Z represents an atomic group necessary to form a heterocyclic nucleus containing a 5- or 6-membered hetero ring, said ring selected from the group consisting of a thiazole ring, an oxazole ring, a selenazole ring, a pyridine ring, a quinoline ring or a tetrazole ring; Y_1 and Y_2, which may be the same or different, each represents a hydrogen atom, an alkyl group, a hydroxyl group, an alkoxy group, an amino group or a sulfo group; L, L_1 and L_2 each represents a methine group; *l, n,* and *p* each represents 1 or 2; and *m* represents 2 or 3.

4,102,689

MAGNESIA DOPED ALUMINA CORE MATERIAL

Marcus P. Borom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,762
Int. Cl.[2] B22C *9/10;* B22D *21/00;* B28B *7/34;* C04B *35/44*
U.S. Cl. 106—38.9 4 Claims

1. A sintered core of a ceramic material suitable for use in the casting and directional solidification of advanced superalloys consisting essentially of

a sintered magnesia doped alumina material composition wherein the magnesia content is from greater than about 1 mole percent to about 20 mole percent,

the microstructure of the sintered magnesia doped alumina is characterized by a matrix comprising an interconnecting network of magnesia doped alumina defining a plurality of interstices in which magnesium aluminate spinel is deposited, and the core material is removable from the solidified casting by autoclave leaching in leaching solutions selected from KOH and NaOH.

4,102,690

POWDER FOR CONTINUOUS CASTING

Janusz Koper, Hofherrgasse 6/27, 1100 Vienna, Austria

Filed Apr. 13, 1976, Ser. No. 676,428
Claims priority, application Austria, Apr. 16, 1975, 2892/75
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.28 10 Claims

1. A flux powder having substantially uniform and reproducible properties for use in continuous casting, consisting essentially of an intimate mechanical mixture of:

silicon dioxide in an amount of 20–60% by weight,

calcium oxide source in an amount of 20–60% by weight,

calcium fluoride in an amount of 3–20% by weight,

alkali metal carbonate, in an amount of 3–20% by weight,

carbon source in an amount of 4–20% by weight and

aluminum oxide in an amount of 0–10% by weight, wherein the inorganic components of said mixture are present in a substantially pure state.

4,102,691

GELLABLE BINDERS

Ian Richard Walters, Huddersfield, and Harold Garton Emblem, Mirfield, both of England, assignors to Zirconal Processes Limited, Bromley, England

Continuation-in-part of Ser. No. 561,347, Mar. 24, 1975, Pat. No. 4,025,350. This application Mar. 23, 1977, Ser. No. 780,352
Claims priority, application United Kingdom, Mar. 28, 1974, 13834/74; Aug. 13, 1974, 35610/74
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.35 6 Claims

1. A method of producing a shaped refractory object comprising the steps of coating a shaped pattern with a slurry made by combining a refractory powder, an aqueous solution of a zirconium salt which when dissolved in water yields an aqueous solution which is acidic, and a gellation-delaying agent selected from the group consisting of magnesium acetate, magnesium lactate, ammonium lactate, glycine, betaine, fructose and polyhydric alcohols, contacting the slurry with ammonia vapour thereby causing the zirconium salt to gell, and thereafter drying the coating, removing the pattern, and firing the produced article.

4,102,692

REINFORCING GLASS FIBERS OF MGO-CAO-ZNO-AL_2O_3-SIO_2-TIO_2

Wolfgang Schartau, Odenthal-Hahnenberg, and Friedrich Schwochow, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 4, 1976, Ser. No. 693,042
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532842
Int. Cl.[2] C03C *13/00, 3/04;* C04B *31/06*
U.S. Cl. 106—50 3 Claims

1. A glass fiber consisting essentially of MgO-CaO-ZnO-Al_2O_3-SiO_2-TiO_2 of the following approximate molar composition:

MgO	7–27.5 %
CaO	4.5–32.5 %
ZnO	3–15 %
Al_2O_3	5–13.5 %
SiO_2	36–56 %
TiO_2	[0–9] 2– 6 %

wherein the sum of the MgO and CaO contents is about 30 to 40 mole % and the sum of the ZnO and TiO_2 contents is less than about 15 mole %.

4,102,693

PHOTOCHROMIC BORO-SILICATE GLASS

Harry Owen, Parbold, and Thomas Barrow, Ormskirk, both of England, assignors to Pilkington Brothers Limited, Merseyside, England

Filed Jan. 31, 1977, Ser. No. 764,315

Claims priority, application United Kingdom, Jan. 30, 1976, 3785/76

Int. Cl.[2] C03C *3/10, 3/08, 3/26*

U.S. Cl. 106—54 **4 Claims**

1. A photochromic boro-silicate glass having a half fading time of not more than 60 seconds which has silver halide crystals dispersed throughout the glass, and which is free from barium, consisting essentially of, in weight percentages:

SiO_2	31 to 59%
B_2O_3	18 to 28%
Al_2O_3	8 to 20%
R_2O	6 to 16%
MgO	0 to 2.6%
P_2O_5	0 to 12%
ZrO_2	0 to 7%
TiO_2	0 to 5%
PbO	0 to 7%

where R_2O represents one or more of Li_2O, Na_2O and K_2O in amounts within the ranges 0 to 3% Li_2O, 0 to 8% Na_2O and 0 to 16% K_2O,

and, in weight percentages expressed as quantities over and above the 100% total of all the other components:

silver, expressed as Ag_2O	0.05 to 4%
halide	0.13 to 1%
CuO	0 to 1%.

4,102,694

REFRACTORY MATERIAL FOR REPAIRING BLAST FURNACES

Kantaro Sasaki, Ashiya; Hiroshi Yamaoka, Hirakata, and Takao Suzuki, Takarazuka, all of Japan, assignors to Sumitomo Metal Industries, Limited, Osaka, Japan

Division of Ser. No. 581,436, May 28, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,468

Int. Cl.[2] C04B *35/02*

U.S. Cl. 106—56 **15 Claims**

1. A method for repairing linings on internal walls of blast furnaces within their operational cycle comprising the steps of forming a nonaqueous repair material which material is composed of 100 parts by weight of a base material chiefly composed of a powdery refractory material, 4 to 40 parts by weight of a bituminous material serving as a binder and 10 to 35 parts by weight of a liquid oil serving as a fluidity imparting agent, pouring the repair material into a blast furnace under pressure while said furnace is at a temperature elevated above a surrounding ambient temperature during the operational cycle of said furnace, and allowing the repair material to cure to thereby repair defects in the lining of the blast furnace.

4,102,695

REFRACTORY COMPOSITIONS WITH CERAMIC AND HYDRAULIC SETTING

André Claverie, Abbeville, France, assignor to E.F.S.I. Etablissements pour la Fabrication de Specialites Industrielles, Abbeville, France

Filed Sep. 9, 1974, Ser. No. 504,531

Claims priority, application France, Sep. 7, 1973, 73 32320

Int. Cl.[2] C04B *35/02*

U.S. Cl. 106—64 **3 Claims**

1. Moldable refractory composition for blast furnaces which consists of a mixture of 80 to 94 parts by weight of refractory aggregates having a granulometry of 50μ to 5 mm, 12 to 4 parts by weight of an aluminous hydraulic cement having a pH in the range of 8 to 12, 8 to 2 parts by weight of a refractory material of the kaolinite type having a granulometry lower than 50μ, 0.6 to 0.01 parts by weight of a substance capable of deflocculating and/or fluidizing kaolinite in an aqueous medium having a pH within the range of 6 to 9.2, and 0.6 to 0.01 parts by weight of a neutral or substantially neutral polyphosphate binder capable of retarding the hydraulic setting of the cement.

4,102,696

DIELECTRIC CERAMIC COMPOSITION FOR HIGH FREQUENCIES

Masayoshi Katsube, Youkaichi; Youhei Ishikawa, Kyoto; Hiroshi Tamura, Omihachiman, and Kunisabro Tomono, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,502

Claims priority, application Japan, Jul. 31, 1975, 50-93983; Jul. 31, 1975, 50-93984; Jul. 31, 1975, 50-93985; Jul. 31, 1975, 50-93986

Int. Cl.[2] C04B *35/00;* **H01B** *1/06, 3/02*

U.S. Cl. 106—73.2 **5 Claims**

1. A dielectric ceramic composition for high frequencies consisting essentially of 83 to 99.8 wt% of a basic composition composed of 22 to 43 wt% of titanium dioxide dioxide, 38 to 58 wt% of zirconium and 9 to 26 wt% of stannic oxide, and 0.2 to 17 wt% of one or two additives selected from the group consisting of lanthanum oxide and cobaltic oxide.

4,102,697

FLUID PLASTER COMPOSITION

Kozo Fukuba; Yasutomo Ogushi, both of Niihama, and Haruhisa Harada, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 8, 1976, Ser. No. 703,376

Claims priority, application Japan, Jul. 9, 1975, 50-84807; Mar. 1, 1976, 51-22491

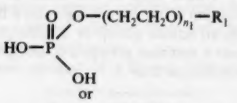
Int. Cl.[2] C04B *11/14*

U.S. Cl. 106—111 **23 Claims**

1. A plaster composition which comprises:

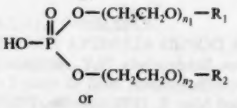
(1) gypsum containing gypsum hemihydrate of the α-form in an amount of not less than about 50% by weight of the total plaster content,

(2) about 0.01 to 10 parts by weight to 100 parts by weight of the gypsum of a surface reactive agent of a phosphoric ester of the formula:



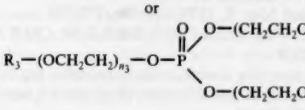
(I)

or



(II)

or



(III)

wherein R_1, R_2, and R_3 are each alkyl, alkylaryl or aryl having 1 to 50 carbon atoms, and n_1, n_2, and n_3 are each an integer of 1 to 30,

(3) a sulfonic dispersing agent, and

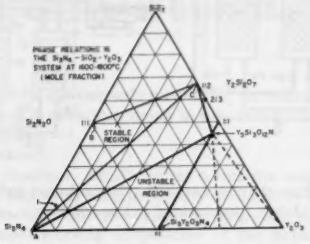
(4) an alkali metal sulfate selected from the group consisting of sodium sulfate, potassium sulfate, rubidium sulfate and cesium sulfate.

4,102,698

SILICON NITRIDE COMPOSITIONS IN THE Si_3N_4-Y_2O_3-SiO_2 SYSTEM

Frederick F. Lange, and Subhash C. Singhal, both of Franklin Twsp., Westmoreland County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,380
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—65 2 Claims



1. A sintered ceramic composition suitable for use as a high temperature structural material, said composition being within a triangular area defined by the points ABCA of the Si_3N_4-SiO_2-Y_2O_3 ternary diagram depicted in FIG. 2, and containing from about 0.03 to about 0.01 mol fraction Y_2O_3, from about 0.075 to about 0.40 mol fraction SiO_2, and the balance consisting of Si_3N_4.

4,102,699

STABLE AQUEOUS ALKALI METAL SILICATE/IRON OXIDE PIGMENT SUSPENSIONS

Hans-Joachim Scholl; Peter Markusch, both of Cologne, and Dieter Dieterich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1977, Ser. No. 797,952
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624790
Int. Cl.[2] C09D *1/02*
U.S. Cl. 106—84 9 Claims

1. Aqueous, sedimentation-resistant alkali metal silicate/iron oxide pigment suspensions comprising:

A. from about 10 to about 40%, by weight, of iron oxide pigment,

B. from about 20 to about 40%, by weight, of alkali metal silicate and

C. from about 30 to about 70%, by weight, of water, wherein at least 95% by weight of the iron oxide pigment has a particle size equal to or less than 1 μ.

4,102,700

PROCESS FOR THE PRODUCTION OF A MIXTURE TO BE UTILIZED IN THE PRODUCTION OF BUILDING MATERIALS AND A DEVICE FOR CARRYING OUT THE PROCESS

Ludwig Kwech, Kaltenleutgeben, and Fritz Jung, Vienna, both of Austria, assignors to Perlmooser Zementwerke Aktiengesellschaft, Vienna, Austria

Filed Aug. 26, 1976, Ser. No. 717,884
Claims priority, application Austria, Aug. 27, 1975, 6604/75
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—100 4 Claims

1. In a method for the production of a mixture to be utilized in the production of building materials comprising at least two heated inorganic components of components of differing composition, the first component being subjected to a heating process and the other component or components being heated to a temperature below the heating temperature of the first component, the improvement comprising the steps of:

heating the first component to a first temperature, the component being selected from the group consisting of Portland cement clinker of conventional composition, conventional lime, argilliferous lime, and dolomitic lime; and,

adding the remaining components of the mixture sequentially to the first component to establish intimate contact between said remaining components and the first component while the first component is at or near said first temperature, said remaining components being heated to lower temperatures as compared to the first component,

said first component being a Portland cement clinker of conventional composition and at least one of the said other components to be heated to lower temperatures as compared to the temperature of said Portland cement clinker of conventional composition is selected from the group consisting of felspars, oil shale residues, bauxites, laterites, trasses, volcanic rocks, and glasses, the said materials having pozzuolana properties imparted to silicate and aluminate qualities thereof by heating.

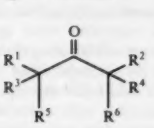
4,102,701

PLASTER COMPOSITIONS CONTAINING OXO-POLYCARBOXYLIC ACIDS AS A SET RETARDER

Colin Dennis Campbell, Cheadle; Michael Anthony Finan, Macclesfield, and Kenneth William Shelton, Sale, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 17, 1976, Ser. No. 667,777
Claims priority, application United Kingdom, Mar. 19, 1975, 11373/75
Int. Cl.[2] C04B *11/14*
U.S. Cl. 106—111 17 Claims

1. A plaster composition comprising a plaster derived from gypsum or phosphogypsum and 5 to 5000 parts by weight per million parts by weight of plaster of a compound or mixture of compounds having the formula:



I

in which R^1, R^2, R^3 and R^4 are hydrogen, C_1-C_4 alkyl or $—CH_2CH_2COOH$, R^5 and R^6 are hydrogen, $—CH_2CH_2COOH$ or together form a polymethylene chain which is unsubstituted or substituted by one or more alkyl groups and which contains a total of not more than 7 carbon atoms; provided that at least two of the groups R^1, R^2, R^3, R^4, R^5 and R^6 are $—CH_2CH_2COOH$; or the salts thereof with inorganic or organic bases.

4,102,702

COMPOSITION AND METHOD FOR APPLYING METALLIC SILVER TO A SUBSTRATE

Harry Bahls, Wayne, Pa., assignor to Peacock Industries, Inc., Philadelphia, Pa.

Division of Ser. No. 513,417, Oct. 9, 1974, Pat. No. 3,983,266. This application Jun. 7, 1976, Ser. No. 693,363
Int. Cl.[2] C23C *3/02*
U.S. Cl. 106—1.23 12 Claims

1. In an aqueous solution for use in precipitating metallic silver from an ionic solution on the surface of a substrate, the combination which comprises a water-soluble reducible silver salt, an alkali metal hydroxide, and ammonia, the improvement which comprises including a polyhydric alcohol of the formula $CH_2OH(CHOH)_nCH_2OH$, where n is an integer from 1 to 6.

4,102,703

WATER-REPELLENT COATING COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Paul Raymond Tully, Lowell, Mass., assignor to Tulco, Inc., N. Billerica, Mass.

Filed Nov. 8, 1976, Ser. No. 739,343
Int. Cl.[2] C09K 3/18; B01J 13/00
U.S. Cl. 106—287.14 27 Claims

1. A liquid water-repellent coating composition comprising a hydrophobic finely-divided particulate metal or metalloid oxide having a BET-N_2 surface area of at least about 50 m^2/gram suspended in a liquid component which does not wet said oxide chosen from the group consisting of liquid, water-soluble polyhydric alcohols and aqueous solutions thereof and an amount of gas colloidally dispersed in said liquid component at least sufficient to encapsulate the hydrophobic finely-divided particulate metal or metalloid oxide in a layer of said gas.

15. A method for preparing liquid water-repellent oxide-gas suspensoid coating compositions which comprises intensively mixing, in the presence of a gas, a hydrophobic finely-divided particulate metal or metalloid oxide and a liquid suspending component which does not wet said oxide, said liquid component being chosen from the group consisting of water-soluble liquid polyhydric alcohols and aqueous solutions thereof, and the amount of gas incorporated in the compositions being at least sufficient to encapsulate the finely-divided particulate metal or metalloid oxide in a layer of said gas.

4,102,704

PIGMENTARY COMPOSITIONS BASED ON ESTERS OF RESIN ACIDS AND AMINO-ALCOHOLS

Pierre Louis Edmond Fournier, Scotteville les Rouen, and Jean Paul Mayer, Saint Etienne du Rouvray, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 24, 1977, Ser. No. 761,571
Claims priority, application France, Feb. 4, 1976, 76 03040
Int. Cl.[2] C08K 5/23
U.S. Cl. 106—288 Q 11 Claims

1. A pigmentary composition comprising an intimate mixture of (a) an organic pigment and (b) one or more unmodified or modified resin acids esterified with an aminoalcohol, wherein the intimate mixture constituting the new pigmentary composition is obtained by incorporating in the pigment, which is in the form of an acid aqueous suspension, a solution of the ester in a solvent miscible with water, or a dispersion of the ester in acidulated water, then precipitating the said ester by making the aqueous reaction medium alkaline or by addition of a monocarboxylic acid having from 2 to 25 carbon atoms or dicarboxylic acid or an unmodified or modified resin acid, this addition resulting in the formation of a salt insoluble in water.

4,102,705

METHOD FOR REMOVING ACIDS FROM AN AQUEOUS ACID-CONTAINING XYLOSE SOLUTION

Hans Jorg Pfeiffer; Keller Rene, both of Winterthur, and Frank Erich, Raeterschen, all of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,855
Claims priority, application Switzerland, Jul. 2, 1975, 8594/75
Int. Cl.[2] C13K 1/02, 13/00
U.S. Cl. 127—37 4 Claims

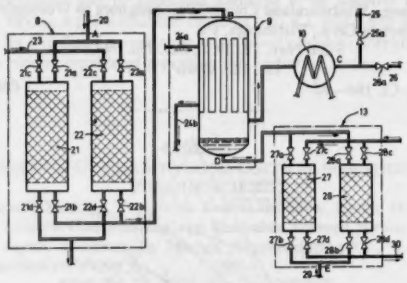
1. A method of producing an acid-free xylose solution comprising the steps of

hydrolyzing a raw material containing xylane with a strong acid to obtain an aqueous acid-containing xylose solution;

subjecting the solution to an ion-exchange to remove the strong acid;

thereafter heating the remaining xylose solution to evaporate water, acetic acid and formic acid therefrom while concentrating the xylose solution; and

subjecting the concentrated xylose solution to an ion-exchange to remove any traces of acetic acid and formic



acid from the concentrated xylose solution and to produce an acid-free concentrated xylose solution.

4,102,706

REMOVING IRIDESCENT STAINS FROM VITREOUS SURFACES

Lazarus D. Thomas, Maumee, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Mar. 16, 1977, Ser. No. 777,897
Int. Cl.[2] B08B 3/08; C03C 23/00
U.S. Cl. 134—3 4 Claims

1. A method of removing iridescent stain from glass surfaces comprising contacting said surfaces with a solution consisting essentially of the following components in the indicated proportions: 2.5 to 7.5 grams of sodium fluoride, 2.5 to 7.5 milliliters of concentrated hydrochloric acid, and 250 milliliters of water; maintaining said contact for at least 30 seconds; and thereafter rinsing said solution from said surface with water.

4,102,707

REMOVAL OF MICROBIOLOGICAL DEPOSITS

K. Robert Lange, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 400,461, Sep. 24, 1973, abandoned. This application Jun. 10, 1976, Ser. No. 694,860
Int. Cl.[2] B08B 9/00
U.S. Cl. 134—22 R 7 Claims

1. A method of detaching slime adhered to a support in an aqueous medium which consists essentially of contacting said aqueous slime with a sufficient quantity for the purpose of an agent which possesses hydrogen-bonding characteristics and selected from the group consisting of ethanolamine and derivatives thereof to penetrate the strongly hydrated slime structure and modify such to the extent that the slime is detached from the support.

7. A composition for detaching slime adhered to a support in an aqueous medium which consists essentially of:

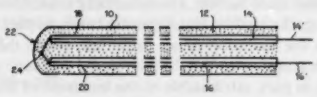
(i) a member of the group consisting of ethanolamine, and derivatives thereof so long as the derivatives have hydrogen-bonding characteristics; and

(ii) at least one member of the group consisting of ethanolamine, amine-epoxy compound reaction products and derivatives of each so long as the derivatives have hydrogen-bonding characteristics with the proviso that the member of (i) is different from the member of (ii) and wherein the members of (i) and (ii) are present in the composition in a weight ratio of from about 5 to 95% and 95 to 5% respectively.

4,102,708
SELF-HEALING THERMOCOUPLE

Edna A. Dancy, Beaconsfield, Canada, assignor to Sidbec-Dosco Ltee, Montreal, Canada

Filed Jan. 18, 1977, Ser. No. 760,372
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—233 18 Claims



1. A device for continuously monitoring the internal surface temperature of a refractory lining in a metallurgical furnace, which comprises:

an outer sheath;

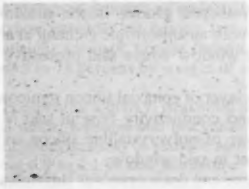
a pair of dissilimar, metallic wires within the outer sheath, each of said wires being separately insulated by a sleeving of a refractory material having a melting point higher than the normal working temperature of the furnace at the surface of the lining; and

a powdered oxide material closely packed within the sheath and surrounding both insulated wires, said oxide material being electrically conductive at elevated temperatures and having a melting point higher than said normal working temperature; whereby said insulating refractory material and conductive oxide material, on exposure to said normal working temperature, react with each other to form a conducting bridge between the dissimilar wires at the surface of the lining, operative to provide a signal related to said internal surface temperature.

4,102,709
WORKABLE NICKEL ALLOY AND PROCESS FOR MAKING SAME

Berthold Wenderott, and Gerhard Köhlert, both of Altena, Fed. Rep. of Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 542,932, Jan. 22, 1975, Pat. No. 3,998,663. This application Oct. 28, 1976, Ser. No. 736,598
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404256; May 24, 1974, 2425271; Aug. 9, 1974, 2438381
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.
Int. Cl.[2] C22F *1/10*
U.S. Cl. 148—2 9 Claims



1. A process for producing a workable nickel composition, said process comprising the steps of:

(a) forming a melt consisting of 0.01 to 0.15% by weight oxygen, the balance nickel;

(b) casting said melt to form an ingot containing said oxygen in the form of nickel oxide, at least part of the nickel oxide being present as a nickel/nickel-oxide eutectic; and

(c) hotforming said ingot to destroy the nickel/nickel-oxide eutectic thereof and finely distribute the nickel oxide uniformly in the metallic lattice structure of the hot-formed body.

4,102,710
ADJUVANT COMPOSITION FOR SOLVENT PHOSPHATIZING SOLUTION

Edward A. Rowe, Jr., Mentor, and William H. Cawley, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

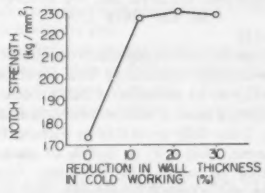
Filed Dec. 22, 1976, Ser. No. 753,435
The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 R 12 Claims

1. In a methylene chloride and water-containing liquid composition having a continuous and homogeneous liquid phase suitable for phosphatizing metal with a coating of at least substantial water insolubility, with said liquid phase containing water in minor amount, which composition comprises methylene chloride, solubilizing solvent capable of solubilizing phosphoric acid in methylene chloride, a phosphatizing proportion of phosphoric acid, and water in an amount exceeding said proportion of phosphoric acid, while being sufficient for said composition to provide a phosphatized coating of substantial water insolubility, and while retaining liquid phase homogeneity, the improvement which comprises said composition being characterized by containing phenolic stabilizing substance in an amount above about 0.2 weight percent, basis total composition weight, wherein said phenolic stabilizing substance is selected from the group consisting of phenol, substituted phenols having one or more ring substituents selected from the group consisting of alkyl and alkoxy, bis-phenols, bis-phenols having connecting alkyl ring linkage, and any of said bis-phenols having one or more substituents on each ring which are selected from the group consisting of alkyl and alkoxy.

4,102,711
METHOD OF PRODUCING A TUBE OF ULTRA-HIGH STRENGTH STEEL HAVING REMARKABLY IMPROVED DUCTILITY AND TOUGHNESS

Tatsuro Kunitake, Toyonaka; Iwao Saito, Osaka; Kazuo Tsumura, Ibaraki; Masahiro Nishio, Amagasaki; Masaru Nishiguchi, Izumi, and Yasutaka Okada, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 26, 1977, Ser. No. 827,989
Claims priority, application Japan, Aug. 31, 1976, 51-105468
Int. Cl.[2] C21D *9/08*
U.S. Cl. 148—12.3 3 Claims

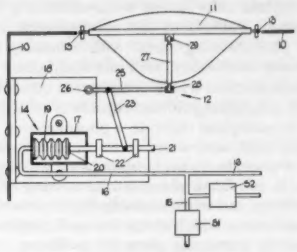


1. A method of producing a tube of an ultra-high tensile steel having remarkably improved ductility and toughness and having tensile strength over 255 kg/mm², which comprises preparing a mother tube through the hot extrusion of a steel consisting essentially of 15.0 - 18.5% by weight of Ni, 12.5 - 15.0% by weight of Co, 5.0 - 6.9% by weight of Mo, 1.00 - 1.28% by weight of Ti, 0.01 - 0.20% by weight of Al and the balance essentially iron, cold working the mother tube with a reduction in wall thickness of 5 - 25%, then raising the temperature of the resulting tube to a temperature of 800°–950° C in a period of time of from 20 minutes to 2 hours, maintaining the heated tube at this temperature for from 30 minutes to 3 hours, and, after cooling to or below room temperature, ageing the resulting tube at a temperature of 450°–550° C for 1 - 10 hours.

4,102,712
HEADLAMP TILTING MECHANISM IN A MOTOR VEHICLE

Frederick Raymond Patrick Martin, Bromley, England, assignor to C.I. Hayes Inc., Cranston, R.I.

Filed Mar. 26, 1975, Ser. No. 562,117
Claims priority, application United Kingdom, Mar. 30, 1974, 14210/74
Int. Cl.[2] B60Q *1/10*
U.S. Cl. 362—71 **4 Claims**



1. In a motor vehicle comprising a body and a headlamp mounted for tilting movement relative to said body, a mechanism for tilting said headlamp, said mechanism including an axially slidable drive member including means restraining the drive member to axial movement, a lever pivotally mounted relative to said body for pivotal movement transversely with respect to the direction of axial movement of said drive member and connected with said headlamp, said lever extending generally parallel to said drive member, and a single link extending transversely between and being pivotally connected to said lever and to said drive member, the arrangement of said lever, said single link, and said drive member causing movement of said lever through axial displacement of said drive member and said drive member opposes movement of said link and lever due to external forces imposed on said headlamp and transmitted through said lever and link to said drive member.

4,102,713
SILICON STEEL AND PROCESSING THEREFORE

Jack W. Shilling, Monroeville; Clarence L. Miller, Jr., and Amitava Datta, both of Pittsburgh, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1976, Ser. No. 696,967
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **13 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1870 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, from 0.02 to to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, up to 1.0% copper, no more than 0.008% aluminum, from 2.5 to 4.0% silicon, balance iron; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel in a hydrogen-bearing atmosphere having a dew point of from +20° to +110° F; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement comprising the steps of coating the surface of said steel with a refractory oxide base coating consisting essentially of:

(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;

(b) up to 100 parts, by weight, of other substances from the group consisting of boron and compounds thereof; said coating containing at least 0.1%, by weight, of boron;

(c) from 0.5 to 100 parts, by weight, of at least one oxide less stable than SiO_2 at temperatures up to 2150° F, said oxide being of an element other than boron;

(d) Up to 40 parts, by weight, of SiO_2;

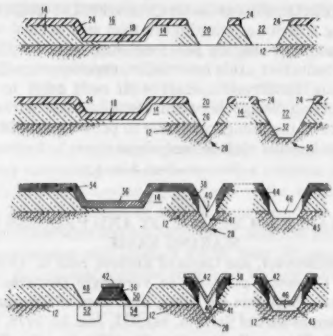
(e) up to 20 parts, by weight, of inhibiting substances or compounds thereof; and

(f) up to 10 parts, by weight, of fluxing agents; and final texture annealing said steel with said coating thereon; said annealed steel having a substantially continuous reacted coating; the quality of the coating being, in part, attributable to the inclusion of an oxide less stable than SiO_2 at temperatures up to 2150° F; the steel's magnetic properties being, in part, attributable to the inclusion of boron in the base coating.

4,102,714
PROCESS FOR FABRICATING A LOW BREAKDOWN VOLTAGE DEVICE FOR POLYSILICON GATE TECHNOLOGY

David E. DeBar, Manassas, and Francisco H. De La Moneda, Reston, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,544
Int. Cl.[2] H01L *21/22, 21/302, 29/78*
U.S. Cl. 148—187 **5 Claims**



1. A process for simultaneously making a low voltage breakdown p-n junction protective device and a polycrystalline silicon gate FET device in a silicon semiconductor substrate of a first conductivity type, comprising the steps of:

forming a window in a field oxide layer on the surface of said substrate where said FET device is to be located and growing a thermal oxide layer on the surface of the portion of the silicon substrate exposed through said window;

etching a V-shaped groove in the silicon semiconductor substrate with an anisotropic etchant, at a location spaced from said window where said protective device is to be formed;

depositing a layer of epitaxial silicon semiconductor material of a second conductivity type in said V-shaped groove and a layer of polycrystalline silicon over said thermal oxide layer in said window;

etching source and drain openings through said polycrystalline silicon layer and thermal oxide layer in said window forming a polycrystalline gate electrode on a thermal oxide gate insulator;

diffusing source and drain regions of a second conductivity type through said source and drain openings;

forming an electrical contact with said epitaxial silicon layer in said V-shaped groove;

whereby an abrupt p-n junction protective device is formed having a small radius of curvature at the apex of the V-shaped groove with a corresponding low breakdown voltage, simultaneously with the formation of a polycrystalline gate FET device.

4,102,715
METHOD FOR DIFFUSING AN IMPURITY INTO A SEMICONDUCTOR BODY

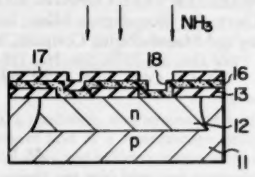
Ginjiro Kambara, Ashiya; Susumu Koike, Ibaraki, and Toshio Matsuda, Ohtsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,124

Claims priority, application Japan, Dec. 19, 1975, 50/152659; Dec. 19, 1975, 50/152660; Dec. 19, 1975, 50/152661; Dec. 19, 1975, 50/152662; Dec. 19, 1975, 50/152664; Dec. 19, 1975, 50/152668

Int. Cl.[2] **H01L** *21/225*

U.S. Cl. 148—188 **10 Claims**



1. A method for diffusing an impurity into a semiconductor body comprising the steps of

forming an impurity containing silicon oxide layer on a semiconductor substrate, and

heat treating the resultant substrate in an ammonia containing atmosphere, the impurity containing silicon oxide layer being selectively exposed to said atmosphere.

4,102,716
TWO-PART REACTIVE DIELECTRIC FILLER COMPOSITION

James D. Groves, St. Paul, Minn., and Deborah Sue Anne D'Zuro, Overland Park, Kans., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 11, 1976, Ser. No. 685,302

Int. Cl.[2] **C08K** *5/01;* **H01B** *17/34*

U.S. Cl. 156—48 **7 Claims**

1. A dielectric, thermally stable, hydrolytically stable, moisture-insensitive polyurethane gel comprising the reaction product of an admixture of:

(a) at least one isocyanate compound having at least about 2.0 NCO groups per molecule and selected from the group consisting of aliphatic and cycloaliphatic isocyanate compounds;

(b) a polyalkadiene polyol having an average equivalent weight of at least about 500 and containing at least about 2.0 terminal hydroxyl groups per molecule;

(c) a hydrocarbon extender oil having less than about 35 percent by weight aromatic groups therein, said oil comprising about 5 to 75 percent by weight of said admixture; and

(d) a catalyst comprising a dialkyl organotin compound and a trialkyl tin oxide; wherein said isocyanate compound is present in sufficient quantity to provide an NCO/OH ratio of from about 0.9 to 1.1 in said admixture.

4. A process for filling a polycarbonate connector-containing communication cable splice closure comprising pouring into said closure, at ambient temperature, an admixture of:

(a) at least one isocyanate compound having at least about 2.0 NCO groups per molecule and selected from the group consisting of aliphatic and cycloaliphatic isocyanate compounds wherein said isocyanate compound is present in sufficient quantity to provide an NCO/OH ratio of from about 0.9 to about 1.1 in said admixture;

(b) a polyalkadiene polyol having an average equivalent weight of at least about 500 and containing at least about 2.0 terminal hydroxyl groups per molecule;

(c) a hydrocarbon extender oil having less than about 35 percent by weight aromatic groups therein, said oil comprising about 5 to 75 percent by weight of said admixture; and

(d) a catalyst comprising a dialkyl organotin compound and a trialkyl tin oxide; and allowing said admixture to react to form a thermally and hydrolytically stable moisture-insensitive polyurethane gel, said gel being substantially inert toward said polycarbonate connector.

4,102,717
DIELECTRIC OPTICAL WAVEGUIDE COUPLINGS

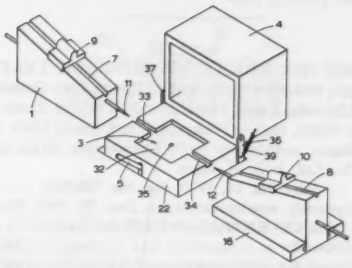
Paul Christopher Hensel, Suffolk, England, assignor to The Post Office, London, England

Filed Nov. 2, 1976, Ser. No. 737,907

Claims priority, application United Kingdom, Nov. 5, 1975, 45965/75

Int. Cl.[2] **G01B** *19/34*

U.S. Cl. 156—64 **21 Claims**



1. A method of making an optical coupling between two dielectric optical waveguides of the type in which two dielectric optical waveguides are aligned in a grooved plate and retained in said grooved plate, said method comprising the steps of:

(a) locating an end of a first dielectric optical waveguide, and an end of a second dielectric optical waveguide in a groove in a grooved plate,

(b) Launching light into one of said first or second dielectric optical waveguides so that light escapes from an end of said one dielectric optical waveguide,

(c) Sliding said first dielectric optical waveguide longitudinally in said groove towards said second dielectric optical waveguide until said light that escapes is observed to have minimum intensity, and

(d) Fixing said first and second dielectric optical waveguides to said grooved plate in such a manner that said ends of said first and second dielectric optical waveguides are rigidly held in position relative to each other.

4,102,718
METHOD AND DEVICES FOR APPLYING TAPE MARKING MATERIAL ON ROAD SURFACES

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,693

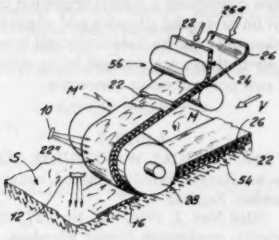
Claims priority, application Italy, Jan. 12, 1976, 19163A/76; Nov. 17, 1976, 29453A/76

Int. Cl.[2] **E04B** *2/00;* **B32B** *7/14;* **E01C** *23/16*

U.S. Cl. 156—71 **7 Claims**

1. A method of forming a traffic-regulating indicium on a road surface, comprising the sequential steps of melting an at least predominantly thermoplastic primer; firmly bonding the molten primer as a layer to a face of a tape to thereby form a two-layered indicium band; and pressing said indicium band down against the road surface while the primer layer is in an at least partially molten condition and with sufficient force to drive the primer layer into pores and cavities of the road, said

previous step of bonding being performed by spreading the molten priner over only a portion of the width of the face of



the tape so as to retain substantially all of the primer layer under the face of the tape despite squeezing of the primer layer during said pressing step.

4,102,719

PROCESS FOR PRODUCING ARTIFICIAL LEATHER

Sadao Fujii; Hidehiko Maki, both of Kyoto; Toru Orisaka, Uji; Shoji Matsuda; Koichi Nishida, both of Kyoto; Tamio Ishiai; Tasaku Nishii, both of Wakayama, and Yuichi Ueda, Osaka, all of Japan, assignors to Dynic Corporation, Kyoto and Kao Soap Co., Ltd., both of, Japan

Filed Jul. 15, 1976, Ser. No. 705,514

Claims priority, application Japan, Dec. 20, 1975, 50-152460

Int. Cl.[2] B29D *27/04;* **B32B** *5/20, 31/14*

U.S. Cl. 156—78 **10 Claims**

1. A process for producing an artificial leather, which comprises coating a composition, comprising as the essential component, a urethane prepolymer prepared from a polyol and an organic polyisocyanate in a ratio of the isocyanate group equivalent [NCO] to the hydroxy group equivalent [OH] of 2.0 to 4.0, a combination of an amine catalyst and a metallic catalyst and a foam stabilizer and including a plurality of extremely fine cells of an inert gas, onto a release paper in a thickness of 0.03 to 0.5 mm; expanding and resinifying the resultant under an atmosphere of a temperature of 40° to 95° C and a humidity of 60% or more until the coating layer becomes semisolid so that the number of the foams in the coating layer becomes 5,000 foams/inch^2 or more and the density of the coating layer becomes 80 - 700 g/liter; laminating a base sheet onto the coating layer under a pressure so that the thickness of the coating layer becomes about 0.95 to 0.4 times that before the laminating of the base sheet; heating the laminated product at a temperature of 90° to 180° C, and then peeling off the release paper.

4,102,720

PROCESS FOR PRODUCING SYNTHETIC RESIN LAMINATES

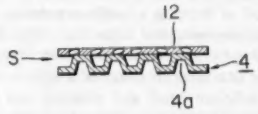
Takafumi Kaneko, Hiroshima; Shuzo Sasagawa, Iwakuni; Noriyuki Ishii, Tokyo; Takashi Hiraoka, Yamaguchi, and Shozo Hieda, Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,005

Claims priority, application Japan, Dec. 25, 1975, 50/153988

Int. Cl.[2] B32B *5/18*

U.S. Cl. 156—78 **6 Claims**



1. A process for producing a laminate composed of a synthetic resin supporting plate possessing at least two protrusions in a traverse direction and a synthetic resin foamed sheet having fine through-holes and fusion-fixed to the protrusions of said synthetic resin supporting plate which comprises heating a synthetic resin supporting plate possessing at least two protrusions in a traverse direction to a temperature suitable for fusion-fixing, pressing an extruded synthetic resin foamed sheet on the protrusions to form a laminate, and applying a draft to the said laminate at a rate greater than but not exceeding five times the rate at which the synthetic resin foamed sheet is extruded to produce numerous fine through-holes in the synthetic resin foamed sheet.

4,102,721

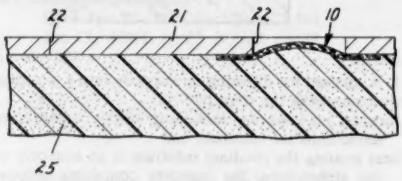
BARRIER TAPE CONSTRUCTION

Patrick H. Carey, Jr., Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1976, Ser. No. 731,540

Int. Cl.[2] C09J *7/02;* **B32B** *7/10*

U.S. Cl. 156—79 **5 Claims**



1. A gas-permeable, foam-impermeable pressure-sensitive adhesive barrier tape consisting essentially of a thin, porous, nonwoven web formed from a mixture of hydrophobic staple length textile fibers and cellulosic paper length fibers unified with a pressure-sensitive adhesive resin composition which substantially coats the fibers to thereby bond them together at their crossing points while leaving the interstices of the web substantially unfilled, said barrier tape having air-flow resistance values to the passage of air at 100 ft./min., air face velocity of between about 0.10 to about 0.7 inch of water, and a porous, tacky, pressure-sensitive adhesive surface on one side thereof and a substantially non-tacky surface on the other.

5. The method of insulating a cabinet having spaced inner and outer walls enclosing a space comprising providing at least one filler opening of adequate size and a plurality of vent openings, covering said vent openings with a gas-permeable, foam-impermeable pressure-sensitive adhesive barrier tape according to claim 1 and introducing through said filler opening a foam-forming polyurethane composition.

4,102,722

METHOD OF MAKING HEATED LAMINATED WINDOW

George W. Shoop, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 591,218, Jun. 27, 1975, Pat. No. 4,057,671.

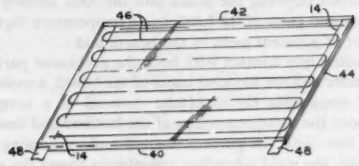
This application Jul. 28, 1977, Ser. No. 819,808

Int. Cl.[2] B32B *17/00;* **B60L** *1/02*

U.S. Cl. 156—99 **11 Claims**

1. A method of making a transparent electroconductive window comprising assembling a plurality of assembly elements, which include a sheet of rigid transparent material and a layer of thermoplastic interlayer material, at least one of said assembly elements supporting electroconductive material over an area of said element to be heated to form an electroconductive circuit portion carried by said assembly element, applying to a pair of opposite edge portions of said electroconductive circuit portion long, narrow strips of electroconductive material consisting essentially of a mixture of 85–97 parts by weight

of finely divided particles of a highly electroconductive metal selected from the group of silver, gold, platinum, copper and aluminum dispersed within 15–3 parts by weight of finely divided particles of an electroconductive metal alloy having a fusion point between about 70° C. and about 150° C. in a volatile carrier at a temperature below said fusion point, drying said long, narrow strips, assembling said one assembly element with said other assembly elements in such a manner that said dried narrow strips are disposed at an interfacial surface between said one assembly element and one of said other assembly



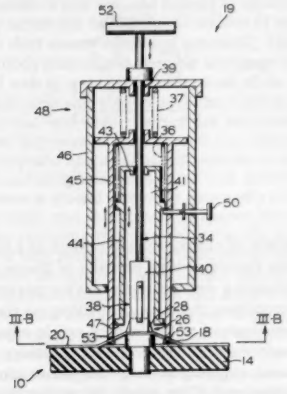
elements to form a sandwich, and laminating said sandwich at an elevated pressure and at a temperature above the fusion point of said metal alloy and below a temperature at which said alloy flows excessively at said elevated pressure to fuse said metal alloy to said circuit portion and to form a transparent electroconductive window having bus bars consisting essentially of a mixture of 85–97 parts by weight of finely divided metal particles dispersed within 15-3 parts by weight of finely divided particles of a metal alloy having a fusion point between about 70° C. and about 150° C.

4,102,723

METHOD FOR FORMING A TIRE CARCASS HAVING AN OPENING

Herbert G. Pinkham, Minonk, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 21, 1977, Ser. No. 789,478
Int. Cl.[2] B29H *15/00*
U.S. Cl. 156—120 **18 Claims**



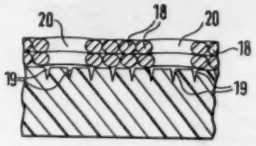
1. A method for forming a tire carcass having a valve opening, comprising:
laying up a first tire forming material and forming a tire carcass base having a valve opening;
inserting a separating element into the valve opening and positioning an intermediate portion of the separating element adjacent the valve opening and overlaying the first tire forming material;
laying up reinforcing elements on the carcass base and over the intermediate portion of the separating element;
moving the reinforcing elements overlaying the intermediate portion of the separating element to a position immediately adjacent the intermediate portion of the separating element and valve opening and forming the valve opening through the reinforcing elements;
fixing said reinforcing elements immediately adjacent said separating element; and
removing the separating element from the resulting valve opening.

4,102,724

METHOD OF MAKING A HOSE HAVING AN IMPROVED SURFACE APPEARANCE

Challen E. Taylor, Portadown, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 30, 1976, Ser. No. 671,799
Claims priority, application United Kingdom, May 12, 1975, 19918/75
Int. Cl.[2] F16L *1/04*
U.S. Cl. 156—149 **7 Claims**



1. A method of making a mandrel supported hose such as to accomodate expansion and contraction of various of the elements comprising the hose structure during vulcanization and prevent the elements from exuding to the outer surface and impairing the surface appearance thereof, comprising the steps of:
A. forming a plurality of regularly spaced longitudinal recesses in the outward facing surface of an uncured, mandrel-supported, rubber tube by extruding the tube through a die opening having a configuration of the recesses;
B. applying a layer of reinforcement filaments over the tube;
C. extruding a layer of uncured rubber over the reinforcement layer; and
D. vulcanizing the composite structure, said recesses providing necessary expansion space for the rubber as it tends to move radially outward upon being vulcanized.

4,102,725

METHOD OF MAKING A LAMINAR HOLLOW BODY OF ANGULAR CROSS-SECTION AND APPARATUS FOR PERFORMING THE METHOD

Richard Wolfgang Mosse, London, England, assignor to Corrugated Products GmbH, Frankfurt am Main, Germany

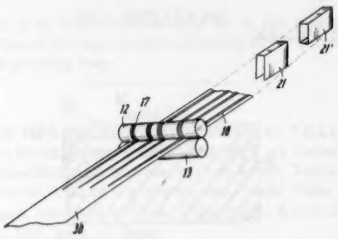
Filed Apr. 26, 1977, Ser. No. 791,014
Int. Cl.[2] B31F *1/00;* **B29D** *23/10*
U.S. Cl. 156—200 **12 Claims**

1. A method of making a laminar body from a plurality of elongated sheet members, each sheet member having first and second, opposite major faces separated by the thickness of the sheet member, which method comprises:
(a) moving a first, a second, and a third sheet member continuously and longitudinally, said sheet members being moved sequentially through a coating zone, a forming zone, a securing zone, and a bending zone, said zones being offset from each other in the direction of sheet movement;
(b) coating two of said major faces of said first, second, and third sheet members in said coating zone with an adhesive composition over the respective full widths thereof;
(c) forming a plurality of transversely spaced, longitudinal, integral ribs in the first faces of said first and second sheet members and respective, coextensive, longitudinal

grooves in the second faces of said first and second sheet members in said forming zone;

(d) adhesively securing the first face of said third sheet member to the second face of said second sheet member in said securing zone in fixed area contact in a position in which respective portions of the secured faces bound an elongated duct in each groove of the second sheet member, said two major faces including one of said secured faces;

(e) adhesively securing in said securing zone the first face of said second sheet member to the second face of said first sheet member in area contact in a position in which said ribs of said second sheet member are received in respective grooves of said first sheet member, and said ribs of the



second sheet member and respective portions of said first sheet member bound an elongated duct in each receiving groove, said two major faces including one of the faces of said first and second sheet members secured to each other; and

(f) angularly bending said first, second, and third sheet members while secured to each other in said area contact about a plurality of lines parallel to and adjacent respective grooves of said second sheet member, through respective angles smaller than 180°, said second face of the third sheet member bounding a corner of the angular laminar body resulting from said bending, and said first and second sheet members being offset outward of said corner from said third sheet member.

4,102,726

JOINING METHOD

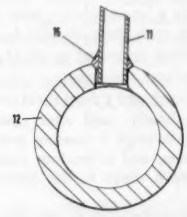
Derek Samuel Brackman, Stanmore, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 22, 1976, Ser. No. 707,763

Claims priority, application United Kingdom, Aug. 4, 1975, 32488/75

Int. Cl.[2] B29F *3/04*; C09J *5/00*

U.S. Cl. 156—244.11 **2 Claims**



1. A method for manufacturing a heat exchanger of a kind through which a heat exchange fluid is circulated during use, comprising the steps of

forming a hollow board of plastic material, the board being internally subdivided into longitudinal tubular passages extending from one end of the board to the other;

locating at either end of the board a tubular header of plastics material having a wall thickness greater than that of the hollow board, each header having at least one aperture aligned with the ends of the tubular passages of the board so as to permit flow of a heat exchange fluid between the interior of the tubular header and said passages;

applying a heated tool to the surface of the parts of the headers which are adjacent to the board while avoiding contact between the board and the tool, thereby to preheat said parts of the header to a temperature higher than that of adjacent parts of the board; and

extruding into contact with both the preheated parts of the header and the adjacent parts of the board, a molten bead of compatible thermoplastic material at a temperature above the softening points of the headers and board so as to fuse with the parts contacted and on cooling form a weld, the weld extending completely round the adjacent parts of header and board so as to seal against loss of any fluid which may flow between the header and the board during use.

4,102,727

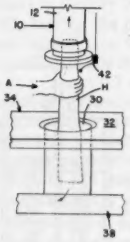
METHOD FOR CLOSING END PORTIONS OF TUBULAR FABRIC ARTICLES

Cecil R. Bell, Pinnacle, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Mar. 21, 1977, Ser. No. 779,720

Int. Cl.[2] B32B *31/18*

U.S. Cl. 156—251 **6 Claims**



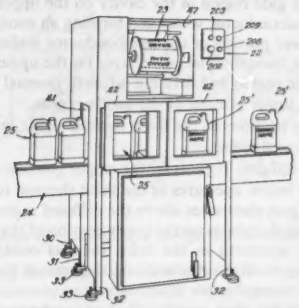
1. The method of closing the toe portion of a tubular fabric hosiery article formed at least partially of thermoplastic yarn and provided with a welt portion and a toe portion having an open end, comprising the steps of; picking up the article and holding a first segment of the hosiery article adjacent the toe portion, transferring the article to a toe-closing station in a selected manner, applying a continuous pneumatic force to the toe portion open end of the article for urging the toe portion open end away from the remainder of the article being held at the toe closing station, applying a gripping force to a second segment of the article spaced from the first segment and intermediate the first segment and the open end of the toe portion by circumferentially gathering and constricting the tubular hosiery article, releasing the first segment of the article, applying heat to the article intermediate the gripped segment and the open end of the toe portion to fuse the thermoplastic yarns together to close the toe portion and sever the toe end waste fabric therefrom, and automatically transferring the toe closed article to a predetermined location upon release of the gripping force.

4,102,728

LABEL APPLYING APPARATUS

Donald C. Smith, Melrose Park, Ill., assignor to Sterling Associates, Inc., Westmont, Ill.

Filed May 19, 1977, Ser. No. 798,652
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—362 10 Claims



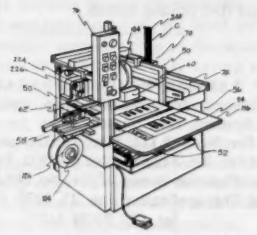
1. Apparatus for automatically applying flexible band labels about the exterior of containers, wherein labels are supplied in the form of an elongated tubular web having individual band labels separably connected in end-to-end relation, comprising: a horizontal labeling station, reciprocating loader means for moving containers horizontally to and from said station including relatively moveable spaced arm means operable to positively grip and move a container to and from said station and to hold the same thereat in upright label receiving position; label supply means comprising means for storing a supply web of labels and means for guiding the outer end portion of said web into overdisposed alignment with a container at said station; label opening means suspended within said outer end portion in coaxial vertical alignment with a container at said station and comprising a planar body portion engagable with the interior walls of said web and formed to separate said walls substantially across the full lateral dimension of said web, and rigid spaced skirt means extending outwardly along opposite sides of said body portion and operable to engage the separated walls of said web in response to movement of the same thereover; said skirt means serving to open the outer end portion of said web so that said walls thereof are stretched externally thereover and in general alignment with the exterior periphery of an underdisposed container at said station; such open outer end portion including laterally spaced wall portions engaging said skirt means in spaced symmetry outwardly of the plane of said body portion and interjoined by spaced intervening end wall portions extending transversely across the opposite ends of said spaced skirt means; a pair of selectively operable clamp means mounted on opposite sides of said opening means for linear horizontal movement toward and away from said skirt means thereof, said clamp means cooperating with said skirt means to firmly clamp said laterally spaced wall portions therebetween; a pair of gripper means adjacent said opposite ends of said skirt means comprising cooperating pairs of relatively movable finger means, engagable with the inside and outside faces of said intervening end wall portions and linearly movable to positively grip the latter; elevator means supporting said gripper means and operable to periodically elevate and lower the same vertically between said opening means and said station whereby to position said finger means for gripping engagement with said end wall portions and to transfer an opened label gripped thereby from said opening means downwardly over the exterior of a container positioned at said labeling station; means for periodically operating said gripper means to sequentially grip a label at said opening means and to release the same about the exterior of a container at said station; the lowering movement of said gripper means and a label gripped thereby serving to advance the next succeeding label onto said opening means; and additional means for periodically operating said clamp means to clamp each opened label to said skirt means thereby to disrupt its separable connection with a preceding label being moved downwardly with said gripper means.

4,102,729

APPARATUS FOR HANDLING STOCKINGS

Dulin Land Annas, Sr., Hickory, N.C., assignor to Speizman Industries, Inc., Charlotte, N.C.

Filed Apr. 29, 1977, Ser. No. 792,264
Int. Cl.[2] B23P *19/02, 11/00;* B65C *5/00*
U.S. Cl. 156—384 24 Claims



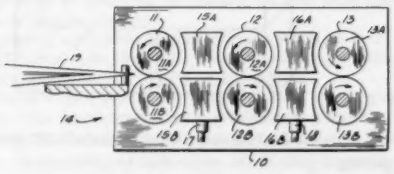
1. Apparatus for handling stockings to affix labels, transfers and hanger clips thereto comprising a carrier plate for supporting and conveying a pair of superposed stockings transversely from a loading station through label and transfer applying stations to a folding station, means for indexing said carrier plate through said stations, means at said label applying station engagable with an end portion of a pair of stockings at a side edge of said carrier plate and operable to fold an adhesive coated label over the end portion of said stockings and apply pressure thereto sufficient to cause the label to adhere to said end portion, means at said transfer applying station for transferring indicia from a transfer strip onto one of said stockings by a hot transfer iron, stocking folding means at said folding station engagable under said pair of stockings intermediate their ends to lift said stockings from said carrier plate and thereby support said stockings in folded condition, means for moving said stocking folding means to lift said stockings and to transport them to a hanger clip inserting station, means for inserting a hanger clip from a supply into said folded stockings, and means for discharging said stockings from said hanger clip inserting station to a collection station.

4,102,730

TWO STAGE OVEN LAMINATOR

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Division of Ser. No. 584,374, Jun. 6, 1975, Pat. No. 4,056,422.
This application Sep. 27, 1977, Ser. No. 837,295
Int. Cl.[2] B37B *31/00;* B31F *5/00;* B02C *11/08*
U.S. Cl. 156—499 5 Claims



1. An oven type plastic laminating apparatus for laminating

heat sensitive plastic material and discrete sheet of material comprising:

a housing;

a first pair of feed rollers rotatably mounted in said housing;

a second pair of laminating rollers rotatably mounted in said housing and spaced from said first pair;

a third pair of laminating rollers rotatably mounted in said housing and spaced from said second pair of rollers;

first heater means disposed between said first and second pair of rollers;

second heater means disposed between said second and third pair of rollers;

said first heater means operating at a temperature providing only partial lamination between said materials and said second heater means operating at a higher temperature than said first heating means.

4,102,731

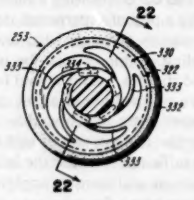
LABEL APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 449,111, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 23, 1976, Ser. No. 651,749

Int. Cl.[2] B32B *3/10*

U.S. Cl. 156—540 **11 Claims**



1. For a label applying machine: an applicator, means for advancing labels or the like into applying relationship with respect to the applicator, the applicator including at least one wheel having an annular rim, means for mounting the wheel, and means resiliently connecting the rim and the mounting means to provide resilient yielding of the wheel while the applicator applies a label to merchandise.

4,102,732

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

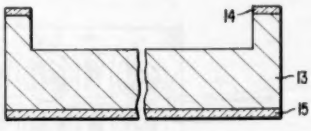
Taketoshi Kato; Masato Uchida, both of Yokohama, and Kenichi Goto, Sagamihara, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 8, 1976, Ser. No. 739,948

Claims priority, application Japan, Nov. 8, 1975, 50-133599

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—645 **1 Claim**



1. A method for manufacturing semiconductor devices comprising:

coating the upper portion of a semiconductor wafer with a first thermal oxide layer and coating the lower portion of the semiconductor wafer with a second thermal oxide layer,

removing a portion of the first thermal oxide layer to form a cavity therein,

removing a portion of the upper portion of the semiconductor wafer to form a cavity surrounded by a peripheral frame,

removing the second thermal oxide layer,

forming a gate region in the cavity on the upper portion of the semiconductor wafer and forming an anode region on the lower portion of the semiconductor wafer,

forming a third thermal oxide layer on the upper portion of the gate region and forming a fourth thermal oxide layer on the lower portion of the anode region,

removing portions of the third thermal oxide layer to form apertures therein,

forming diffused regions in the upper portion of the gate region below apertures in the third thermal oxide layer,

forming gate electrodes above the diffused regions, forming cathode electrodes on the upper portion of the gate region within apertures in the third thermal oxide layer and forming an anode electrode on the bottom portion of the fourth thermal oxide layer, and

separating the gate region, the semiconductor wafer, the anode region, the fourth thermal oxide layer and the anode electrode along a dicing line substantially perpendicular to the upper portion of the gate region.

4,102,733

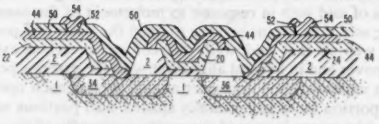
TWO AND THREE MASK PROCESS FOR IGFET FABRICATION

Francisco H. De La Moneda, Reston, and Harish N. Kotecha, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,278

Int. Cl.[2] H01L *21/22*

U.S. Cl. 156—653 **13 Claims**



1. A process for fabricating an IGFET device, comprising:

masking with a first mask and etching to define gate, source and drain openings in a thick insulating layer on a silicon semiconductor substrate;

coating all exposed surfaces with successive layers of thin insulating material and polysilicon;

masking with a second mask and etching said polysilicon and thin insulating layer in said source and drain regions and dip etching to remove said thin insulating material polysilicon composite layer therein;

introducing a conductivity enhancing dopant in the exposed source and drain regions;

coating all exposed surfaces with a silicide forming metal layer;

sintering said metal layer to form a silicide coating on said polysilicon layer in the gate region to form a gate electrode and on the exposed silicon in the source and drain regions to form source and drain contacts;

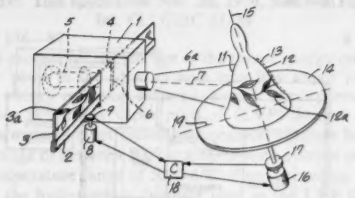
preferentially etching the unreacted portions of said metal layer;

whereby an IGFET device is fabricated.

4,102,734
METHOD FOR PRODUCING A DESIGN ON AN ARCUATE SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Westport, Conn.

Filed Oct. 5, 1976, Ser. No. 729,764
Int. Cl.[2] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—659 8 Claims

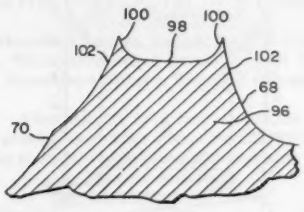


1. A method of producing a design on an arcuate surface, comprising:
(a) forming the design upon a relatively flat transparency;
(b) progressively and sequentially exposing narrow areas of the transparency to a directional light source whereby images of the design are progressively and sequentially projected in the direction of the light;
(c) providing the arcuate surface with a photosensitive coating;
(d) disposing the arcuate surface spaced from the transparency such that narrow areas thereof are progressively and sequentially maintained substantially perpendicular to the direction of the light and substantially parallel with the projected images;
(e) rotating the arcuate surface about its axis in synchronization with the progressive movement of the transparency such that the projected images of the design are progressively and sequentially received by said narrow areas of the arcuate surface such that all points within said narrow areas are within the sphere of focus and the design is exposed upon the photosensitive coated arcuate surface;
(f) processing the exposed coating on the arcuate surface to selectively produce the design upon the surface.

4,102,735
DIE AND METHOD OF MAKING THE SAME

Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 696,564, Jun. 16, 1976, Pat. No. 4,053,348. This application Jun. 13, 1977, Ser. No. 805,461
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—661 20 Claims

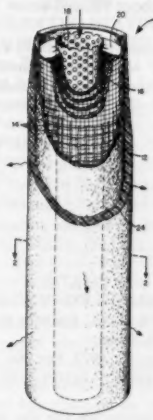


1. In a precision die comprising a die block having a working face with a plurality of die elements each having a surface area with delineating edge lines and recesses separating said die elements, a method of forming recesses in the surface areas of said die elements, said method comprising: p1 a. providing a plurality of modified reduced overlay patterns, each of which has a pattern area corresponding in configuration to that of the die elements, said reduced overlay patterns each having pattern figures having delineating edge lines spaced inwardly from those of the die elements of the die element configuration by a predetermined substantially uniform width dimension, said overlay patterns comprising at least a first and second reduced overlay pattern, with said first reduced overlay pattern having delineating edge lines spaced inwardly a greater distance, and the second reduced overlay pattern having delineating edge lines spaced inwardly a lesser distance,
b. covering the working face of the die block with a first protective overlay corresponding to the first reduced overlay pattern, said first protective overlay having overlapping edge portions that overlap edge portions of the die elements to a greater extent, while leaving middle portions thereof exposed,
c. exposing the working face of the die to an etching medium to form recessed areas in the die elements and form upstanding edge portions on said die elements,
d. covering the working face of the die block with a second protective overlay corresponding to the second reduced overlay pattern, said second overlay having overlapping edge portions that overlap edge portions of the die elements to a lesser extent, while leaving middle portions thereof exposed, and
e. again exposing the working face of the die to an etching medium to deepen and widen said recessed areas to form said upstanding edge portions of the die elements to a narrower configuration conforming with relatively high uniformity to the die element configuration.

4,102,736
METHOD OF MANUFACTURING AN INSIDE-TO-OUTSIDE FLOW FILTER TUBE

Brian Arthur Head, Maidstone, England, and Philip C. Kimball, Andover, Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England

Division of Ser. No. 679,569, Apr. 23, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,407
Int. Cl.[2] D21D *3/00*; D21H *1/08*
U.S. Cl. 162—104 33 Claims



1. A process of preparing an inside-to-outside flow filter tube, which process comprises:
(a) dispersing a plurality of glass fibers in water to form a water slurry of the fibers, the glass fibers having a diameter range of from about 0.001 to 10 microns;
(b) forming a filter tube comprising a wet mat of the glass fibers from the water slurry on a cylindrical mandrel;
(c) during the forming of the wet mat of fibers into a filter tube, encapsulating an open-scrim, reinforcing sheet material within the internal wall thickness of the wet mat of fibers forming the filter tube, the sheet material extending

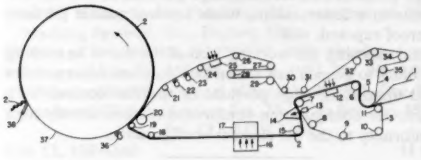
generally the length of the filter tube and at least about one and one-half revolutions of the filter tube diameter;
(d) drying the filter tube containing the scrim sheet material within the filter tube wall;
(e) bonding the dried filter tube with a bonding agent at the junction of the glass-fiber crossover points and with and through the scrim sheet material; and
(f) recovering an integral filter tube having a high burst strength.

4,102,737

PROCESS AND APPARATUS FOR FORMING A PAPER WEB HAVING IMPROVED BULK AND ABSORPTIVE CAPACITY

Wendell J. Morton, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 16, 1977, Ser. No. 797,281
Int. Cl.[2] D21F *9/02*; D21H *5/02, 5/06*
U.S. Cl. 162—113 **15 Claims**



1. A low-density papermaking process for the manufacture of a soft, bulky and absorbent paper sheet having a basis weight between about 5 and about 40 pounds per 3,000 square feet, as measured in an uncreped state, comprising the steps of:
(a) forming a moist paper web directly between a first traveling foraminous support member and a second traveling foraminous support member comprised of filaments which form knuckles at their points of intersection and having more open interstitial area than said first foraminous support member, said second foraminous support member having between about 100 and about 3,600 mesh openings per square inch;
(b) subjecting said moist paper web to a fluid pressure differential while said web is constrained between said first traveling foraminous support member and said second traveling foraminous support member while said web is at a fiber consistency sufficiently low to permit partially displacing at least one surface of said web in small discrete deflected areas corresponding to the mesh openings in said second foraminous support member; and
(c) drying said web to a fiber consistency of at least about 30 percent without disturbing the deflected areas in said web.

4,102,738

USE OF CHITOSAN IN CORRUGATING MEDIUM

John A. Dzurik, Bethel, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 17, 1977, Ser. No. 760,213
Int. Cl.[2] D21H *3/20*
U.S. Cl. 162—117 **9 Claims**

1. A process for improving the flat crush resistance of a corrugating medium semi-chemical pulp which comprises:
(a) adding to said corrugating medium, at a pH of from about 5–9, a chitosan solution in an amount to provide therein from at least about 0.05% to about 0.6%, based on dry fiber weight, of chitosan, said medium containing from at least about 0.05% to about 32%, based on dry fiber weight, of spent semi-chemical pulping liquor;
(b) forming a web of said corrugating medium pulp;
(c) drying said web; and
(d) corrugating said web.

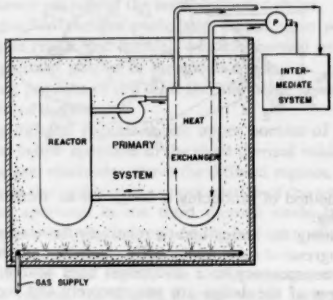
8. Corrugating medium manufactured by the process of claim 1.

4,102,739

METHOD OF SHIELDING A LIQUID-METAL-COOLED REACTOR

Robert K. Sayre, Mt. Lebanon, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,359
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 **7 Claims**



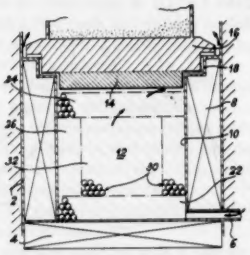
1. A method of shielding the primary heat transport system of a sodium cooled nuclear reactor comprising establishing and maintaining a bed of powdered oxide particles closely and completely surrounding said system by passing a gas upwardly through the bed at a rate effective to slightly expand the bed whereby components of the system are able to expand without damage to themselves while the bed particles remain close enough so that the bed also serves as a guard vessel for the system, and maintaining the the depth of the powdered oxide at a level such that the bed also serves as a biological shield for the system.

4,102,740

MODERATOR STRUCTURE FOR THE CORE OF A MOLTEN SALT REACTOR

Jacques Marcel Blum, Levallois Perret, and Edmond Ventre, Le Vesinet, both of France, assignors to Electricite de France (Service National) and Pechiney Ugine Kuhlmann, both of Paris, France

Filed Jun. 17, 1976, Ser. No. 697,153
Claims priority, application France, Jun. 26, 1975, 75 20118; Oct. 9, 1975, 75 30981
Int. Cl.[2] G21C *5/00*
U.S. Cl. 176—84 **14 Claims**



1. A moderator structure for the core of a nuclear reactor of the molten-salt type, comprising a core space defined by a bottom wall, a top wall and a lateral reflector, said structure being within said space and including a stack of separate nodules applied in mutual contact in the three dimensions of said space and a lattice of interstices in said stack through which the circulation of the molten salt takes place.

4,102,741

LOW VAPOR PRESSURE ORGANIC HEAT RETENTION MATERIALS KEPT AT ATMOSPHERIC PRESSURE USED AS HEAT STORAGE MEDIA

Robert P. Cahn, Millburn, and Edward W. Nicholson, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 533,263, Dec. 16, 1974, Pat. No. 3,998,695. This application Nov. 26, 1976, Ser. No. 745,007

Int. Cl.[2] G21C *15/28*

U.S. Cl. 176—87 8 Claims

1. In a process for the storage of the excess energy output of a power plant in the form of heat in a low vapor pressure thermal energy retention material, kept at atmospheric pressure, using as the low vapor pressure (LVP) thermal energy retention material a petroleum hydrocarbon distillate having a boiling range of between 500° to 1300° F with a vapor pressure in the temperature range of 500°–650° F not exceeding 1 atm., wherein the hydrocarbon distillate used as the LVP thermal energy retention material is selected from the group consisting of 650° to 1050° vacuum pipestill cut, a 600° to 950° F catalytic cracking cycle stock, a 600° to 1000° F thermally cracked gas oil, a 600° to 900° F hydrocracking cut, and a 600° to 900° F coker gas oil.

4,102,742

PROCESS FOR ENZYMATIC ANALYSIS

Sigmar Klose, Berg, Starnberger, and Alexander Hagen, Tutzing, both of Germany, assignors to Boehringer Mannheim, GmbH, Mannheim-Waldhof, Germany

Filed Jun. 3, 1976, Ser. No. 692,701

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526558

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R 12 Claims

1. Process for the enzymatic analysis of a substance to be determined involving at least one enzymatic reaction of the substance to be determined, which process comprises adding a sample solution containing the substance to be determined to an enzyme solution of at least one enzyme, solvent and other necessary reagents, causing at least one principal enzymatic reaction that produces a reaction product to occur, measuring said reaction product, then passing the enzyme solution containing said reaction product through a reactor containing an adsorbent which completely adsorbs and removes said reaction product from the solution, replenishing any used up reagents in the remaining enzyme solution to form a regenerated enzyme solution, and contacting the regenerated enzyme solution with fresh sample solution.

4,102,743

PROCESS FOR THE REMOVAL OF SUCROSE FROM A SUGAR MIXTURE

Koji Yokobayashi, Okayama; Tadashi Ikeda, Tokyo, and Akira Misaki, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 21, 1976, Ser. No. 753,104

Claims priority, application Japan, Dec. 31, 1975, 51-158801

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.[2] C12D *13/02, 13/04*

U.S. Cl. 195—7 4 Claims

1. A process for the removal of sucrose from a sugar mixture without substantially affecting the remaining sugar of the mixture, comprising:

contacting an aqueous solution of a sugar mixture containing sucrose with a water-insoluble glucan produced by the process of cultivating *Streptococcus salivarius* TTL-LP$_1$, FERM-P No. 3310, on a sucrose containing medium and separating and recovering the water-insoluble glucan from the resulting culture broth, to effect reaction therebetween thereby forming a water insoluble glucan from the sucrose.

2. A process for the removal of sucrose from a sugar mixture without substantially affecting the remaining sugar of the mixture, comprising:

contacting an aqueous solution of a sugar mixture containing sucrose with a water-soluble glucan composed of nonreducing terminal residues, alpha-(1→3)-linkage residues, alpha-(1→6)-linkage residues, alpha (1→4)-linkage residues, and alpha-(1→3)-and alpha-(1→6)-branched linkage residues in the ratio of 2:4:3:1:2, to effect reaction therebetween thereby forming a water insoluble glucan from the sucrose, said flucan being produced by *Streptococcus salivarius* TTL-LP$_1$, FERM-P No. 3310.

4,102,744

TWO PHASE FERMENTATION

Carleton J. McCoy, Union, N.J., and Robert D. Schwartz, Charleston, W. Va., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 20, 1976, Ser. No. 752,277

Int. Cl.[2] C12B *1/00, 1/20*

U.S. Cl. 195—28 R 28 Claims

2. A process for conducting an oxidative enzymatic transformation of a linear hydrocarbon substrate comprising conducting the enzymatic transformation in a two-phase fermentation system containing an aqueous nutrient medium and an organic solvent comprising cyclohexane and obtaining an oxidative hydrocarbon conversion of said linear hydrocarbon substrate product from said enzymatic transformation.

4,102,745

PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES

Kenneth N. Thompson, Beach, N. Dak.; Norman E. Lloyd, and Richard A. Johnson, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 500,975, Aug. 26, 1974, Pat. No. 4,011,137. This application Mar. 2, 1977, Ser. No. 773,450

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 R 4 Claims

1. A process for converting starch to dextrose comprising treating starch with alpha-amylase or acid or a combination thereof to obtain a partially hydrolyzed starch solution containing at least 10 percent hydrolyzed starch and then treating the partially hydrolyzed starch solution with an enzyme system comprising entrapped glucoamylase within a polymeric matrix and immobilized alpha-amylase selected from the group consisting of alpha-amylase covalently bonded to an insoluble carrier, alpha-amylase adsorbed on an insoluble carrier, and entrapped alpha-amylase under conditions whereby a hydrolysate containing at least about 92% dextrose on an ash free, dry basis is produced.

3. A process for converting starch to dextrose comprising treating starch with alpha-amylase or acid or a combination thereof to obtain a partially hydrolyzed starch solution containing at least 10 percent hydrolyzed starch and then treating the partially hydrolyzed starch solution with an enzyme system comprising entrapped alpha-amylase and immobilized glucoamylase selected from the group consisting of glucoamylase covalently bonded to an insoluble carrier and glucoamylase adsorbed on an insoluble carrier.

4,102,746
IMMOBILIZED PROTEINS

Bruce S. Goldberg, Clifton, N.J., assignor to Amerace Corporation, New York, N.Y.

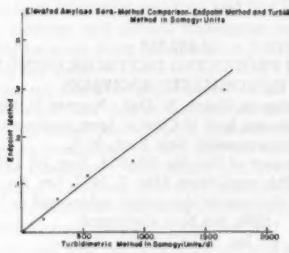
Continuation-in-part of Ser. No. 609,077, Aug. 29, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,291
Int. Cl.[2] C07G *7/00, 7/02*
U.S. Cl. 195—63 **19 Claims**

1. An insoluble composite comprising a microporous member having at least a pair of opposed surfaces and a predetermined thickness, said microporous member comprising a polymeric resinous binder having finely divided filler particles dispersed throughout said binder and a network of substantially interconnected pores formed therein, said pores being formed within said resinous binder, between said filler particles and said resinous binder, and between neighboring filler particles, said dispersed filler particles being present in said microporous member in an amount by weight of at least about 25%, the size distribution of said pores varying non-uniformly across each of said surfaces and across said predetermined thickness through the range of about 0.01 micron to about 100 microns as determined porosimetrically by the Mercury Intrusion Method, and a proteinaceous substance bound to at least some of said filler particles dispersed throughout said binder, said microporous member being previous to the flow of a fluid through at least one of said surfaces wherein at least some of said filler particles to which said proteinaceous substance is bound is adapted to come into contact with such fluid.

4,102,747
AMYLASE DETERMINATION

Richard Cornelius Driscoll, Lake Forest, Ill.; Robert James Gargiulo, and Joseph L. Giegel, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 28, 1977, Ser. No. 820,072
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 C **2 Claims**



1. A process for determining the α-amylase content of a sample comprising the steps of adding a chromogenic oligosaccharide substrate having 4–10 glucose units and a chromophore selected from the group of p-nitrophenol and 4-methylumbilliferone to a solution containing a measured amount of said sample and α and β glucosidase and determining amylase activity by the release of a chromophore selected from the group of p-nitrophenol and 4-methylumbelliferone.

4,102,748
DEVICE FOR PLATING AND STREAKING A MICROBIOLOGICAL SAMPLE

Mary Frances Vacanti, Omaha, Nebr.

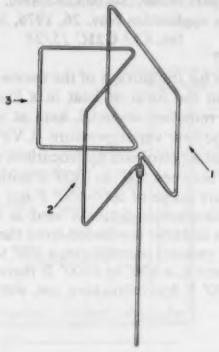
Filed Nov. 9, 1977, Ser. No. 850,040
Int. Cl.[2] C12B *1/02;* C12K *1/04*
U.S. Cl. 195—127 **3 Claims**

1. A manually manipulable device for plating and streaking a microbiological sample comprising:

a stem element adapted to be hand held for manipulation thereof;

a generally closed planar loop, formed of a relatively thin gauge material and topping said stem, whereby a specimen of said microbiological sample may be obtained by dipping and whereby said specimen may be plated onto a substrate;

at least two partial planar loops, coextensive in height with the generally closed loop, and extending from one side of and without touching the plane of said generally closed



loop, and at angles of about 60° from each other and said generally closed loop, and each partial loop having a generally vertical leg section of said coextensive height spaced from said closed loop; and

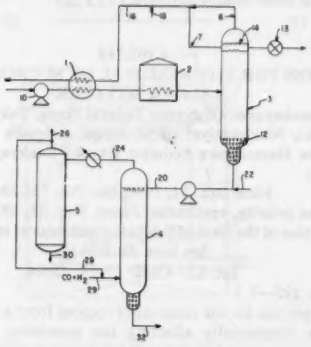
said partial loops being fabricated of a relatively thin gauge material;

whereby after said plating, the device may be rotated and said leg utilized to streak said specimen.

4,102,749
PROCESS FOR MAKING OIL FROM AQUEOUS REACTIVE SLUDGES AND SLURRIES

Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,967, Dec. 16, 1974, Pat. No. 4,030,981. This application Apr. 21, 1977, Ser. No. 789,380
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.[2] C10B *53/02, 57/04, 57/06;* C10G *1/00*
U.S. Cl. 201—2.5 **3 Claims**



1. A process for making low sulfur oil from an aqueous charge containing cellulose and other carbohydrates comprising coking said charge at a temperature in the range of 400° to 550° F under a pressure of 300 to 1200 psig for 5 minutes to 2 hours to form an aqueous slurry containing cokes solids; re-

moving from 50 to 99 percent of the liquid from said slurry; contacting the thus concentrated slurry with hot pressurized synthesis gas at a pressure of between about 500 to 5000 psig at a temperature of between 500° to 750° F to form a low sulfur oil, gases and carbon and inorganic solids and separating said oil from said carbon and inorganic solids and gases.

4,102,750

PROCESS FOR PRODUCING FORMED COKE FOR METALLURGICAL USE

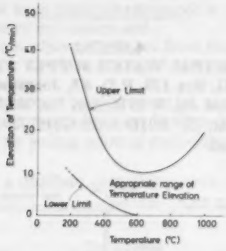
Nobuyoshi Nishihara; Toshiaki Okuhara; Tetu Nishi; Hiroyuki Nakama; Chikara Saito, and Kouichi Yuta, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,813

Claims priority, application Japan, Aug. 18, 1975, 50-99911

Int. Cl.[2] C10B *49/06, 53/08;* **C10L** *5/02*

U.S. Cl. 201—6 **1 Claim**



1. In a process for producing formed coke for metallurgical use wherein agglomerated coal is carbonized by passing it downwardly through an upright carbonizing oven while continuously heating the agglomerated coal with high temperature gases supplied through tuyeres provided at the middle and bottom parts of the carbonizing oven, said agglomerated coal being made from coal powders and binders, the improvement which comprises:

(a) adjusting the temperature of the gas supplied through the tuyeres at the middle part of the carbonizing oven to a temperature between 600° and 800° C;

(b) adjusting the supply rate of the gas supplied through the tuyeres at the middle part of the carbonizing oven so as to maintain the temperature of the gas leaving the top part of the carbonizing oven in the range between 300° and 500° C;

(c) regulating the gas supplied through the tuyeres at the bottom part of the carbonizing oven so that the heat supplied therefrom is less than 50 percent of the total heat supplied to the carbonizing oven; and

(d) controlling the temperature and feed rate of the heating gas such that the rate of temperature elevation of the agglomerated coal as it passes through the oven is within the upper and lower limit ranges of FIG. 1.

4,102,751

COKE OVEN BATTERY WITH CONTROL MEANS FOR CHANGING THE HEAT SUPPLY

Dieter Stalherm, Recklinghausen, and Volker Kolitz, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 15, 1976, Ser. No. 666,634

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2511940

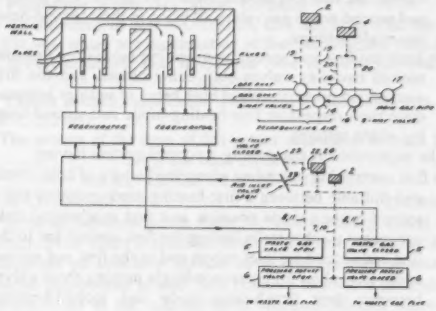
Int. Cl.[2] C10B *5/12;* **F16K** *11/00*

U.S. Cl. 202—151 **1 Claim**

1. In a battery of coke ovens of the type whose successive heating sections are each comprised of first and second parts, the first and second parts being each provided with respective first and second gas ducts for feeding combustion gas into the respective part from the main gas pipe, respective first and second decarbonizing-air ducts for the supply of decarbonizing air, respective first and second three-way valves connected in the respective gas ducts, each three-way valve having a decarbonizing setting in which it connects the respective decarbonizing-air duct to the respective gas duct while blocking the flow of combustion gas, each three-way valve having a combustion-gas setting in which it connects the respective gas duct to the main gas pipe while blocking the flow or decarbonizing air, first and second two-way valves in the respective gas ducts, each two-way valve being located intermediate the main gas pipe and the respective three-way valve, each two-way valve having an open setting and a closed setting,

a first air duct system including a respective first combustion-air-infeed branch and a respective first waste-gas-outfeed branch, a respective first air inlet valve in the combustion-air-infeed branch operative when open for admitting combustion air through the combustion-air-infeed branch into the first part of the heating section, a respective first waste gas valve in the waste-gas-outfeed branch operative when open for conveying waste gas from the first part of the heating section through the waste-gas-outfeed branch to the waste gas flue, and a respective first pressure valve in the waste-gas-outfeed branch downstream of the waste gas valve operative for controlling the flow of gas through the waste-gas-outfeed branch,

a second air duct system including a respective second combustion-air-infeed branch and a respective second waste-gas-outfeed branch, a respective second air inlet valve in



the second combustion-air-infeed branch operative when open for admitting combustion air through the second combustion-air-infeed branch into the second part of the heating section, a respective second waste gas valve in the second waste-gas-outfeed branch operative when open for conveying waste gas from the second part of the heating section through the second waste-gas-outfeed branch to the waste gas flue, and a respective second pressure valve in the second waste-gas-outfeed branch downstream of the second waste gas valve operative for controlling the flow of gas through the second waste-gas-outfeed branch,

the battery of coke ovens being of the type operated with periodic reversal between first and second heating modes,

in the first heating mode the first air inlet valve being open and the second closed, the first two-way valve being open and the second closed, the first three-way valve being in the combustion-gas setting and the second in the decarbonizing setting, the first waste gas valve being closed and the second open, the first pressure valve being closed and the second open,

whereby combustion gas is fed into the first heating section part through the first gas duct, combustion air is fed into the first heating section part through the first combustion-air-infeed branch, waste gas is conveyed from the second heating section part through the second waste-gas-outfeed branch to the waste gas flue, and decarbonizing air is fed into the second gas duct through the second three-way valve,

in the second heating mode the first air inlet valve being closed and the second open, the first two-way valve being closed and the second open, the first three-way valve being in the decarbonizing setting and the second in the combustion-gas setting, the first waste gas valve being open and the second closed, the first pressure valve being open and the second closed,

whereby combustion gas is fed into the second heating section part through the second gas duct, combustion air is fed into the second heating section part through the second combustion-air-infeed branch, waste gas is conveyed from the first heating section part through the first waste-gas-outfeed branch to the waste gas flue, and decarbonizing air is fed into the first gas duct through the first three-way valve,

the battery of coke ovens furthermore being of the type operated with periodic reversal between heating and non-heating modes,

the heating mode being constituted by the aforementioned periodic reversal between the first and second heating modes,

the non-heating mode being constituted by periodic reversal between first and second non-heating modes,

in the first non-heating mode the first and second air inlet valves, the first and second three-way valves, and the first and second waste gas valves all being in their first-heating-mode settings,

in the second non-heating mode the first and second air inlet valves, the first and second three-way valves, and the first and second waste gas valves all being in their second-heating-mode settings,

in both the first and second non-heating modes the first and second two-way valves both being closed, and the first and second pressure valves both being in settings intermediate their respective first-heating-mode and second-heating-mode settings,

the improvement comprising a control system having

a first control bar extending along the battery of coke ovens and shiftable between a first-heating-mode position and a second-heating-mode position and first mechanical linkage means mechanically linking the first control bar to the first and second air inlet valves and to the first and second waste gas valves for correspondingly moving those valves between their first-heating-mode and second-heating-mode settings;

a second control bar extending along the battery of coke ovens and shiftable between a first-heating-mode position and a second-heating-mode position and second mechanical linkage means mechanically linking the second control bar to the first and second three-way valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings,

a third control bar extending along the battery of coke ovens alongside the first control bar and shiftable between a first-heating-mode position and a second-heating-mode position and third mechanical linkage means linking the third control bar to the first and second pressure valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings;

a fourth control bar extending along the battery of coke ovens alongside the second control bar shiftable between a first-heating-mode position and a second-heating-mode position and fourth mechanical linkage means linking the fourth control bar to the first and second two-way valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings; and

controllable coupling means coupling the first control bar to the third control bar and coupling the second control bar to the fourth control bar for causing the first and third control bars when coupled to share shifting movement and for causing the second and fourth control bars when coupled to share shifting movement, but activatable for disestablishing the coupling between the first and third control bars and for disestablishing the coupling between the second and fourth control bars,

whereby said control system is capable of effecting not only reversal between the first and second heating modes but also changeover from the heating mode to the non-heating mode and reversal between the first and second non-heating modes,

this capability resulting from the fact that the aforementioned controllable coupling means is activatable for disestablishing the coupling between the first and third control bars and for disestablishing the coupling between the secondand fourth control bars,

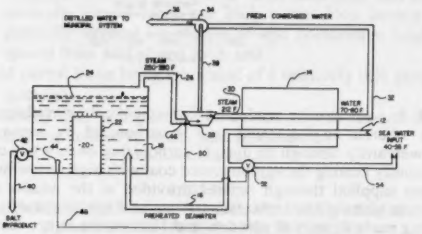
whereby for reversal between the first and second non-heating modes the first and second control bars can continue to be shifted between their first-heating-mode and second-heating-mode positions with the decoupled second and fourth control bars left in positions intermediate their respective first-heating-mode and second-heating-mode positions.

4,102,752

MUNICIPAL WATER SUPPLY SYSTEM

John L. Rugh, II, Box 128, R.D. #5, Johnstown, Pa. 15905

Filed Jul. 9, 1976, Ser. No. 703,777
Int. Cl.[2] B01D *3/00*; G21C *15/16*
U.S. Cl. 202—180 **2 Claims**



1. A water supply system for a water distribution system for providing potable water under pressure from sea water comprising:

(a) a boiler having a boiler chamber for raising the temperature of the sea water to generate high temperature steam of superatmospheric pressure

(b) a nuclear reactor core having top and sides having heat radiators thereon,

(c) said core being mounted within said boiler chamber for directly supply heat to said boiler chamber and having a height and width substantially less than the height and width of said boiler chamber to permit sea water to substantially completely surround and cover said top and sides of said core when said system is in operation,

(d) a sea water intake line connected to said boiler chamber,

(e) an expansion turbine including means connecting said turbine to said boiler chamber,

(f) a steam discharge line connected to said turbine,

(g) a heat exchange condenser,

(h) said sea water intake line and said steam discharge line connected to said heat exchange condenser,

(i) a fresh water discharge line connected to said heat exchange condenser,

(j) pump means driven by said turbine and connected to said fresh water discharge line and to a water distribution system,

(k) a sea water intake by-pass by-passing said heat exchange condenser and connected to said boiler chamber,

(l) valve means for automatically opening said by-pass for bringing cold sea water into said boiler,

(m) a pair of thermal sensors,

(n) one of said thermal sensors being positioned in said boiler chamber and the other of said thermal sensors being posi-

tioned adjacent said turbine and upstream of said turbine, and

(o) said valve means responsive to both of said pair of thermal sensors for controlling the flow of cold sea water into said boiler chamber thereby maintaining a proper temperature in said boiler chamber.

4,102,753

DISTILLATION OF META-CHLORONITROBENZENE IN THE PRESENCE OF A DISTILLATION ADJUVANT

Richard M. Stephenson, Storrs, Conn., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,256
Int. Cl.² B01D *3/34, 3/36*
U.S. Cl. 203—64 **14 Claims**

1. A distillation method comprising:

(a) distilling a mixture comprising

(i) a mixture of chloronitrobenzene isomers containing a majority of meta-chloronitrobenzene in admixture with at least one of its isomers and

(ii) a distillation adjuvant selected from the group consisting of lower alkylene glycols, lower oxyalkylene glycols or glycerol

said distillation adjuvant being present in an amount which provides a meta-chloronitrobenzene distillate having a boiling point lower than the boiling point of meta-chloronitrobenzene, and

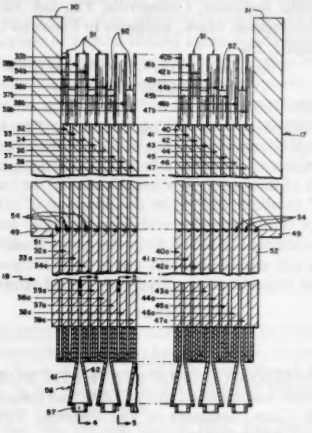
(b) recovering a distillate comprising meta-chloronitrobenzene.

4,102,754

ORE TREATMENT ELECTROLYTIC CELL

Richard A. Hedges, and Maurice H. Pearl, both of Oakland, Calif., assignors to Electrooxidation Systems, Inc., Oakland, Calif.

Filed Oct. 6, 1976, Ser. No. 730,011
Int. Cl.² C25C *7/00, 7/06*
U.S. Cl. 204—275 **10 Claims**



1. In an electrolytic cell apparatus suitable for treatment of an ore slurry, means forming a plurality of electrolytic cells comprising a plurality of spaced electrode plates with cell slurry flowthrough passages therebetween, manifold means for feeding slurry in separate paths to the inlet side of each of said cell flowthrough passages, said manifold means including spaced adjacent non-conductive walls defining a plurality of elongated slots of generally rectangular cross-section transverse to flow, each slot including separate inlets and outlets, individual slurry feed pipes in communication with each of said slot inlets, a main slurry conduit, and stream-splitter means interconnecting said main conduit and feed pipes, the outlets of each of said slots being adjacent to and in communication with the inlets of said flowthrough passages, said manifold means including a flow area expansion section with a cross-section transverse to flow of progressively increasing slot length in the direction of flow.

4,102,755

METHOD OF AND ELECTROLYTIC BATH FOR THE ELECTRODEPOSITION OF SEMIBRIGHT NICKEL AND NICKEL-COBALT COATINGS UPON A METAL SURFACE

Robert Brugger, Bernhausen; Martin Köhl, Düsseldorf, and Horst Krause, Neuss, all of Germany, assignors to Langbein-Pfanhauser Werke AG, Neuss, Germany

Continuation of Ser. No. 625,095, Oct. 23, 1975, Pat. No. 4,010,084, which is a continuation of Ser. No. 475,264, May 31, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,518
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1973, 2327881
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.² C25D *3/12, 3/16, 3/18, 3/56*
U.S. Cl. 204—43 T **11 Claims**

7. In an aqueous acidic bath for electroplating nickel or nickel-cobalt upon a metal substrate, the improvement which comprises an effective amount of a first component and a second component in said bath reactive to form a flocculate incorporated in the coating upon electrodeposition thereof, said first component having at least one C_7 to C_{20} alkyl group and being selected from the group which consists of:

(a) quaternary ammonium compounds of the formula

$$\left\{ R-\overset{\displaystyle R_2}{\underset{\displaystyle R_4}{\overset{|}{\underset{|}{N}}}}-R_3 \right\}^{+} A^{-}$$

where A^- is an anion, R_1, R_2, R_3 and R_4 groups are alkyl, aralkyl or aryl, or two of them are alkyl groups included in a heterocyclic ring with nitrogen as the heterocyclic atom, at least one of the groups R_1 to R_4 include a long chain alkyl having 7 to 20 carbon atoms, the alkyl groups being unsubstituted or include ether, carboxylamide or carboxylic acid groups;

(b) imidazolines;

(c) alkanolamine esters; and

(d) aminocarboxylic acid surfactants,

said second component being selected from the group which consists of:

(e) surface-active alkyl, aryl and alkylaryl, sulfates, sulfonates and phosphates;

(f) aliphatic, alicyclic, aromatic, heterocyclic substituted and unsubstituted sulfates, sulfonic acids and carboxylic acids; and

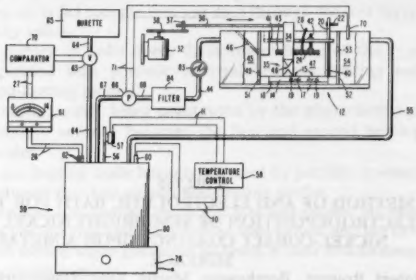
(g) sulfonamides and cyclic or noncyclic sulfonimides.

4,102,756

NICKEL-IRON (80:20) ALLOY THIN FILM ELECTROPLATING METHOD AND ELECTROCHEMICAL TREATMENT AND PLATING APPARATUS

Eugene Evans Castellani, Putnam Valley; John Vincent Powers, Shenorock, and Lubomyr Taras Romankiw, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,893
Int. Cl.[2] C25D *3/56;* C25C *1/24;* C25D *21/14*
U.S. Cl. 204—43 T 26 Claims



1. A nickel-iron electroplating method for coating a substrate having a mask deposited thereon including means for electroplating a nickel-iron film onto a sheet substrate of a metallic material,

said method including employing a plating current density of about 2 – 60 ma/cm^2,

a plating bath fluid having an Fe^{++} ion concentration of about 0.3 g/l to about 1.0 g/l,

an Ni^{++} ion concentration of about 17–44 g/l, a pH of about 1 – 3.6, and maintaining said fluid at a temperature of about 20° – 35° C,

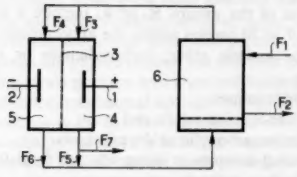
wherein Fe^{++} ion concentration required for plating is inverse to circulation of said plating bath fluid across said substrate.

4,102,757

ELECTROCHEMICAL OXYGEN PRODUCTION METHOD

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Meccaniques "Alsthom et Cie", Paris, France

Filed Oct. 12, 1976, Ser. No. 731,696
Claims priority, application France, Oct. 29, 1975, 75 33082
Int. Cl.[2] C25B *3/04, 1/02*
U.S. Cl. 204—73 R 14 Claims



10. Method according to claim 1, wherein said electrochemical oxidation and reduction are effected at a potential difference equal to the difference between the oxidation-reduction potential of said compound and the potential of the electrochemical oxidation of water.

4,102,758

METHOD OF ELECTROLYTICALLY FORMING SILVER HALIDE GRAINS UTILIZING A NOVEL CATHODE

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 7, 1977, Ser. No. 775,044
Int. Cl.[2] C25B *1/24, 11/04, 11/08*
U.S. Cl. 204—94 10 Claims

1. In a method which comprises the electrolytic generation of silver ions and halide ions employing a silver anode and a cathode which is a source of halide ions and precipitation in the electrolyte of the ion pairs remote from the electrodes to provide photosensitive silver halide grains in the substantial absence of counterions in said electrolyte;

the improvement wherein said cathode comprises elemental halogen and electrically conductive carbon.

4,102,759

METHOD OF ELECTROLYTICALLY FORMING SILVER HALIDE GRAINS UTILIZING A NOVEL ANODE

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 7, 1977, Ser. No. 775,045
Int. Cl.[2] C25B *1/24, 11/04, 11/08*
U.S. Cl. 204—94 9 Claims

1. In a method which comprises the electrolytic generation of silver ions and halide ions employing a silver anode and a cathode which is a source of halide ions and precipitation in the electrolyte of the ion pairs remote from the electrodes to provide photosensitive silver halide grains in the substantial absence of counterions in said electrolyte;

the improvement wherein said anode comprises particulate silver.

4,102,760

CHLORINATION OF POLY (VINYLIDENE FLUORIDE) USING U-V RADIATION

Donald Nellis Robinson, Collegeville, Pa., and Adrian Samuel Fox, Framingham, Mass., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 21, 1977, Ser. No. 761,153
Int. Cl.[2] C08F *8/18, 8/34*
U.S. Cl. 204—159.18 7 Claims

1. A method of chlorinating vinylidene fluoride polymer resin which comprises reacting said resin dispersed in carbon tetrachloride with chlorine at a pressure in the range of about 1 to about 15 atmospheres, a temperature in the range of from about 50° to about 150° C. in the presence of (a) a catalytic amount of triethanolamine and (b) a catalytic amount of an initiator compound selected from the group consisting of acyl peroxides and azo-compounds, and with accompanying exposure of the reaction to a catalytic amount of ultraviolet radiation.

4,102,761

RADIATION CURE OF SYNTHETIC RUBBERS

Georg Gustav Anton Böhm, Akron, Ohio, and Bolesh J. Skutnik, Milford, Conn., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 430,425, Jan. 3, 1974, abandoned, which is a continuation of Ser. No. 148,696, Jun. 1, 1971, abandoned. This application May 28, 1975, Ser. No. 581,493
Int. Cl.[2] C08F *2/46*
U.S. Cl. 204—159.20 10 Claims

10. A method of curing synthetic rubber compositions the major component of which comprises a copolymer containing at least one diolefin polymer or copolymer with another monoolefin having a weight average molecular weight of at least 50,000, a molecular weight distribution of from 1.01 to 30, the

distribution of monomer units affecting the total crosslinking rate being such that when the value of the fraction

$$\frac{G(\text{crosslink})_{Xi}}{G(\text{crosslink})}$$

is greater than 1.5, from 50% to 100% of the monomer whose crosslinking rate contribution is represented by $G(\text{crosslink})_{Xi}$ is in molecules having a molecular weight less than the weight average molecular weight of the synthetic rubber, and when the value is less than 0.5 up to 50% of the monomer whose crosslinking rate contribution is represented by $G(\text{crosslink})_{Xi}$ is in molecules having a molecular weight less than the weight average molecular weight of the synthetic rubber; the value of said fraction in said composition being less than 0.5 or more than 1.5; said composition when substantially pure being radiation curable at an average radiation dose from about 0.5 to 7 megarads, which comprises subjecting said composition to high energy ionizing radiation to an average radiation dose of up to 15 megarads.

4,102,762

PROCESS OF PREPARING MICROSPHERES USING ELECTROMAGNETIC RADIATION

Wolfgang Herman Fritz Sasse, Malvern East, and Mervyn Benjamin Jackson, West Brunswick, both of Australia, assignors to ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia

Filed Mar. 28, 1975, Ser. No. 563,174
Claims priority, application Australia, Apr. 3, 1974, 7146/74
Int. Cl.[2] C08F *2/46*
U.S. Cl. 204—159.22 **10 Claims**

1. A method of preparing microspheres of size less than 20 microns by polymerising a composition comprising up to about 25% of a mixture of monomers said monomer mixture containing a major proportion of an unsaturated carboxylic acid and a minor proportion of a cross-linking agent which method comprises irradiating the said mixture of monomers in a nonpolar and nonhydroxylic solvent with electro-magnetic radiation having a wavelength greater than 180 nanometers, at a temperature in the range from 10° to 90° C, the concentration of unsaturated carboxylic acid being less than 20% w/v, and isolating the polymer so formed.

4,102,763

PREPARATION OF 1-(3,3-DIMETHYL-2-NORBORNYL)-2-PROPANONE

William L. Schreiber, Jackson; James N. Siano, Keyport; Manfred Hugo Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 747,308, Dec. 3, 1976, Pat. No. 4,053,657.
This application Jul. 28, 1977, Ser. No. 819,952
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—162 R **3 Claims**

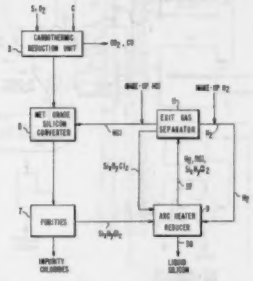
1. A process for preparing 1-(3,3-dimethyl-2-norbornyl)-2-propanone comprising the step of intimately admixing camphene, acetaldehyde, and a 1,2-diketone photochemical hydrogen abstractor; then simultaneously irradiating the reaction mixture with ultraviolet light and adding additional quantities of said, 1,2-diketone photochemical hydrogen abstractor; and isolating said 1-(3,3-dimethyl-2-norbornyl)-2-propanone from the reaction mass.

4,102,764

HIGH PURITY SILICON PRODUCTION BY ARC HEATER REDUCTION OF SILICON INTERMEDIATES

Francis J. Harvey, II, Murrysville, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,383
Int. Cl.[2] B01K *1/00*; C01B *33/02*
U.S. Cl. 204—164 **6 Claims**



1. A process for the production of high purity silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream extending into the reaction chamber, and

(d) feeding into the arc stream a quantity of an intermediate silicon compound selected from the group consisting of SiH_a, SiH_bY_c and SiY_d, where Y is a halide including Cl, Br, I, F, and where a, b, c, and d are whole integers, to react with the arc gas to produce reaction products comprising liquid silicon.

4,102,765

ARC HEATER PRODUCTION OF SILICON INVOLVING ALKALI OR ALKALINE-EARTH METALS

Maurice G. Fey, Plum Borough; Francis J. Harvey, II, Murrysville, and Jack McDonald, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,546
Int. Cl.[2] B01K *1/00*; C01B *33/02*
U.S. Cl. 204—164 **10 Claims**

1. A process for producing the high purity silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

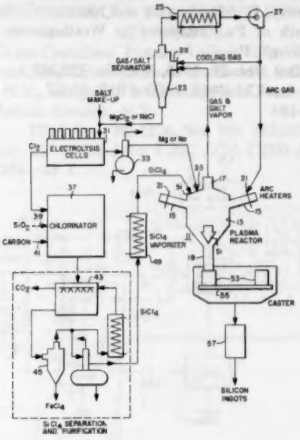
(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream extending into the reaction chamber,

(d) feeding into the arc stream a quantity of a metal reductant selected from the group consisting of an alkali metal and an alkaline-earth metal,

(e) feeding into the arc stream a quantity of silicon halide to react with the metal reductant to produce reaction products including liquid silicon and a salt of the metal reductant,

(f) projecting the reaction products into the reaction cham-

ber tangentially to cause the liquid silicon to separate centrifugally from the gaseous co-product salt, and



(g) depositing the liquid silicon on a downwardly extending surface to permit the liquid silicon to flow into an associated receptacle.

4,102,766

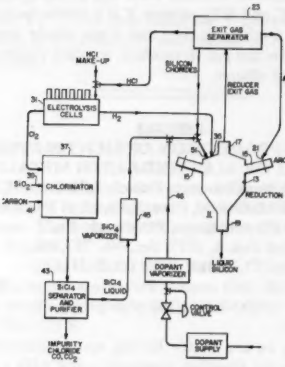
PROCESS FOR DOPING HIGH PURITY SILICON IN AN ARC HEATER

Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,634

Int. Cl.[2] **B01K** *1/00;* **C01B** *33/00;* **C04B** *35/00;* **H01L** *3/06*

U.S. Cl. 204—164 **5 Claims**



1. A method for doping solar grade silicon comprising the steps of:

(a) providing an arc heater having spaced tubular electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in a gap between the electrodes,

(c) feeding into the arc stream a quantity of a metal reductant selected from the group consisting of an alkali metal and an alkaline-earth metal,

(d) feeding into the arc stream a quantity of silicon halide and of a corresponding halide of a doping agent selected from the group consisting of arsenic, aluminum, antimony, boron, bismuth, copper, gallium, indium, iron, lithium, nickel, phosphorous, and zinc, to react with the metal reductant to produce reaction products including a salt of the metal reductant and a mixture of liquid silicon and doping agent, and

(e) separating centrifugally the mixture of liquid silicon and doping agent from the salt.

4,102,767

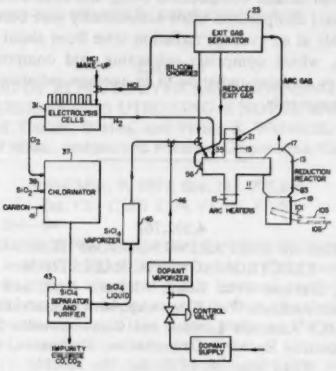
ARC HEATER METHOD FOR THE PRODUCTION OF SINGLE CRYSTAL SILICON

Robert Mazelsky, Monroeville; Maurice G. Fey, Plum Borough, and Francis J. Harvey, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,635

Int. Cl.[2] **B01K** *1/00;* **C01B** *33/02;* **C04B** *35/00;* **H01L** *3/00*

U.S. Cl. 204—164 **14 Claims**



1. A method for producing single crystal silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream,

(d) feeding into the arc stream a quantity of a reductant selected from the group consisting of an alkali metal, an alkaline earth, hydrogen, and a mixture thereof,

(e) feeding into the arc stream a quantity of silicon halide to react with the reductant to produce reaction products including liquid silicon and a gaseous salt of the reductant,

(f) separating the liquid silicon from the gaseous salt of the reducant in the reactive chamber,

(g) depositing the liquid silicon on a downwardly inclined surface, and

(h) attaching a single seed crystal of silicon to the liquid silicon and withdrawing the single seed crystal from the liquid silicon so as to propagate a large single crystal.

4,102,768

METAL OXIDE COATINGS

Martin John Kearin, Redditch; Robert Hiscutt, Birmingham, and Peter Molineux, Bromsgrove, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Continuation of Ser. No. 419,836, Nov. 28, 1973, abandoned.

This application Oct. 26, 1977, Ser. No. 845,771

Claims priority, application United Kingdom, Nov. 29, 1972, 55156/72

Int. Cl.[2] **C23C** *15/00*

U.S. Cl. 204—192 P **56 Claims**

1. In apparatus for depositing a transparent, electrically

conducting, metal oxide film on the surface of a substrate of extended lateral dimensions, said apparatus comprising:

(a) a vacuum chamber;

(b) means for supporting a substrate in the vacuum chamber;

(c) means for maintaining the substrate at a controlled elevated temperature in the vacuum chamber;

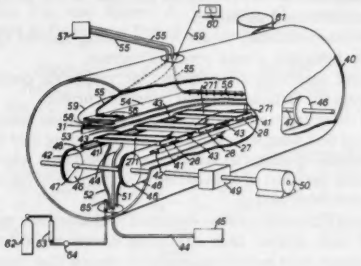
(d) means for supplying a sputtering atmosphere of oxygen and another non-reactive gas or gases at a controlled reduced pressure into the vacuum chamber;

(e) a cathode assembly whose overall lateral dimensions are not substantially less than those of the substrate, arranged substantially parallel to the substrate surface in the vacuum chamber and comprising a plurality of elongated, side-by-side strips of a metal capable of being reactively sputtered, said strips being spaced apart to define passages therebetween;

(f) means for applying a high negative potential to the cathode assembly so as to cause deposition of a metal oxide film on the substrate by reactive sputtering; and

(g) means for oscillating the cathode assembly back and forth in a direction substantially parallel to the substrate surface and transverse to the length of the strips through an amplitude substantially smaller than the overal length of the cathode assembly;

the improvement comprising:



(h) means for controllably varying the thickness of the deposited film over the area of the substrate by bringing different effective widths of the cathode strips into juxtaposition with different parts of the area of the substrate in accordance with the thickness of film which is required to be deposited on the different parts of the area of the substrate,

whereby the film has a controlled variation in resistance over the surface of the substrate.

29. A method of depositing a transparent electrically-conductive metal oxide film on a non-conducting substrate by reactive sputtering from a cathode assembly which is substantially parallel to the area of the substrate to be coated with the film, and whose overall lateral dimensions are not substantially less than those of the substrate, and which is formed of a plurality of elongated, side-by-side spaced-apart strips of the metal, and which is oscillated back and forth in a direction substantially parallel to the said area of the substrate and transverse to the length of the strips, through an amplitude substantially smaller than the overall length of the cathode assembly, but sufficient to cause all parts of the substrate surface to be coated by sputtering from at least one of the strips during the deposition process, wherein control of the thickness of the deposited film over the substrate area is effected by bringing different effective widths of the cathode strips into juxtaposition with different parts of the substrate area.

4,102,769

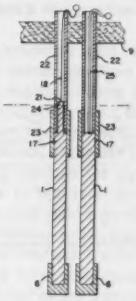
CORROSION PROBE

Robert G. Seyl, 1123 Mulford St., Evanston, Ill. 60202

Filed Apr. 7, 1977, Ser. No. 785,865

Int. Cl.[2] G01N *27/30, 27/08*

U.S. Cl. 204—195 C **7 Claims**



1. An electrode probe for positioning metal electrodes within an ionically conducting liquid comprising:

an electrode of a metal to undergo corrosion, having a cylindrical electrode surface of selected diameter and length;

an electrode mounting tube selected from a material that is corrosion resistant and electrically insulating, said tube positioned with the major axis thereof in alignment with the major axis of said electrode and with the bottom end thereof against the top end of said cylindrical electrode surface such that the length of said tube determines the depth of immersion of said electrode in said ionically conducting liquid; said tube of a diameter substantially equal to the diameter of said electrode for minimum disturbance of liquid flow past said electrodes and surfaces thereof;

electrode holder means for securing said electrode mounting tube in a manner which permits positioning of the electrode for immersion in said ionically conducting liquid;

an electrical conductor in electrical contact with said electrode and extending through said electrode mounting tube and said electrode holder to an electrical terminal;

top electrode shield means comprising a selected length of tubing of a corrosion resistant and electrically insulating material, said tubing positioned over the bottom end of said electrode mounting tube and over the top end of said electrode surface, said tubing having sufficient elasticity to hold said tubing firmly against the electrode and electrode mounting tube surfaces after adjustment of position thereabout;

bottom electrode shield means comprising a selected length of tubing of corrosion resistant and electrically insulating material, a top end of said tubing positioned over the bottom end of said electrode, said tubing having sufficient elasticity to hold said tubing firmly against the electrode surfaces after placement thereover, means for closing a bottom end of said tubing with a corrosion resistant and electrically insulating material;

a water-repellent inert viscous material applied in a thin film to an interface area between said bottom electrode shield means and the bottom end of said electrode and to another interface area between said top electrode shield means, said electrode surface and said electrode mounting tube, thereby substantially preventing crevice corrosion;

said top and bottom electrode shield means thereby accurately defining exposed electrode length and area and further providing substantially uniform current density between said electrodes; and

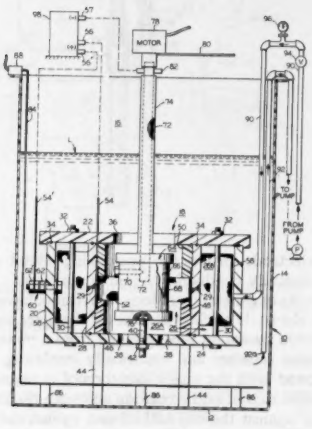
means for securing and releasing said electrode for weight measurement.

4,102,770

ELECTROPLATING TEST CELL

William L. Moriarty, South Meriden, and Robert G. Zobbi, Southbury, both of Conn., assignors to American Chemical and Refining Company Incorporated, Waterbury, Conn.

Filed Jul. 18, 1977, Ser. No. 816,285
Int. Cl.[2] G01N 27/26; C25D 17/00
U.S. Cl. 204—195 R 26 Claims



1. An electroplating test cell comprising:

a. a tank having a bottom wall and a side wall defining a main chamber;

b. a housing within said main chamber and having an outer peripheral wall, a top and a bottom defining a housing chamber;

c. means for supporting said housing within said main chamber;

d. cathode support means carrying cathode connector means thereon and being disposed within said housing chamber and adapted to support a generally annular cathode thereon in electrical contact with said cathode connector means;

e. anode support means disposed within said housing chamber;

f. annular anode means carried by said anode support means outwardly of said cathode support means to define an annular space therewith;

g. rotation/support means for rotatably mounting and effecting rotation of said cathode support means, and thereby a cathode supported thereon, within said housing chamber, said rotation/support means including adjustable mounting means supported within said tank and being adjustable for movement within said cathode compartment to support said cathode support means for positioning thereof at a selected one of different positions within said housing chamber;

h. an inlet conduit disposed in liquid flow communication with said housing chamber to introduce a liquid electrolyte therein, and an outlet conduit disposed in liquid flow communication with said housing chamber to withdraw liquid electrolyte therefrom; and

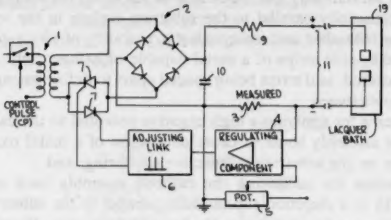
i. electrical connector means adapted to connect said anode and said cathode connector means to respective terminals of an electrical source.

4,102,771

MEASURING DEVICE AND PROCESS FOR RECORDING ON ELECTRODEPOSITION PARAMETERS OF THROWING POWER

Helmut Hönig, Graz, Austria, assignor to Vianova Kunstharz, A.G., Vienna, Austria

Filed Oct. 22, 1975, Ser. No. 624,982
Claims priority, application Austria, Oct. 28, 1974, 8660/74
Int. Cl.[2] C25D 13/00, 13/22
U.S. Cl. 204—299 EC 10 Claims



1. In an electrodeposition bath system including a bath of paint, anode and a cathode electrodes in said bath, and a constant current generating means for maintaining an essentially constant current between said electrodes, the combination of:

sensing means for sensing an increase in the voltage drop between said electrodes;

first time indicating means for recording elapsed time from the initiation of said constant current;

second time indicating means for recording elapsed time from the initiation of said constant current;

first detecting means connected to said sensing means and to said first time indicating means for causing said first time indicating means to record that elapsed time which represents the onset of a sharp rise of voltage drop between said electrodes; and

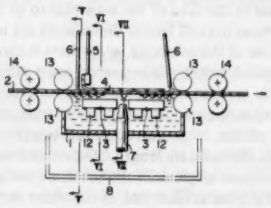
second detecting means connected to said sensing means and to said second time indicating means for causing said second time indicating means to record that elapsed time which represents attainment of a selected voltage drop between said electrodes which occurs subsequent to the onset of said sharp rise.

4,102,772

APPARATUS FOR CONTINUOUSLY ELECTROPLATING ON ONLY A SINGLE SURFACE OF RUNNING METAL STRIP

Masahiro Nakamura; Tetsuaki Tsuda, and Hajime Amakata, all of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 783,024
Claims priority, application Japan, Mar. 31, 1976, 51/39731
Int. Cl.[2] C25D 17/00, 5/02
U.S. Cl. 204—206 6 Claims



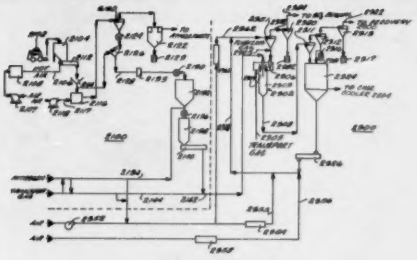
1. In a horizontal-type electroplating apparatus having a tank for containing electroplating bath for continuously elec-

troplating a single surface of metal strip which runs therethrough, said apparatus including a multiplicity of anodes positioned within said tank along the direction of metal strip movement therethrough which have a width substantially equal to the width of the strip, said anodes being in spaced relation to and facing the lower surface of said strip, a pair of opposed dam rolls attached to opposite sides of said tank and in supporting relation to the strip so as to determine the direction of metal strip movement through said tank, and an electrically insulating sheet positioned in close proximity with the upper surface of said strip, the improvement wherein means are provided for maintaining the electroplating solution in said tank at a level substantially equal to the pass-line of said running strip in said tank; wherein means are provided at the bottom of the tank for supplying the plating solution thereto so as to be discharged against the lower surface of said strip; and wherein means are provided for preventing the plating solution from contacting the upper surface of said strip; said means for supplying the electroplating solution comprising a nozzle, and wherein said nozzle is positioned to extend through a floor of said tank and into said tank to a point approximately coincident with the positioning therein of said anodes, and between two adjacent anodes, and so as to discharge electroplating solution towards said strip passing beneath said insulator sheet at a point about midway of the width of said insulator sheet.

4,102,773
PYROLYSIS WITH CYCLONE BURNER

Norman W. Green, Upland, Calif.; Kandaswamy Duraiswamy, Sterling, Va., and Robert E. Lumpkin, Claremont, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,007
Int. Cl.[2] C10B *49/16, 55/08;* C10G *1/00*
U.S. Cl. 208—8 **31 Claims**



1. A continuous process for recovery of values contained in solid carbonaceous materials which comprises the steps of:

(a) providing a feed stream containing a particulate solid carbonaceous material, a substantial portion of the particulate solid carbonaceous material being of a particle size less than about 1000 microns in diameter;

(b) subjecting the particulate solid carbonaceous material to flash pyrolysis by continuously:

(i) transporting the particulate solid carbonaceous material containing feed stream contained in a carrier gas which is substantially nondeteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material to a solids feed inlet of a substantially vertically oriented, descending flow pyrolysis reactor having a substantially vertically oriented pyrolysis zone operated at a pyrolysis temperature above about 600° F;

(ii) feeding a particulate source of heat at a temperature above the pyrolysis zone temperature to a substantially vertically oriented chamber surrounding the upper portion of the pyrolysis reactor, the chamber having an inner peripheral wall forming an overflow weir to a vertically oriented mixing section of the vertically oriented descending flow pyrolysis reactor, the particulate heat source in said chamber being maintained in a fluidized state by the flow therewith of an aerating gas substantially nondeleteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material;

(iii) discharging the particulate source of heat over said weir and downwardly into said mixing region at a rate sufficient to maintain said pyrolysis zone at the pyrolysis temperature;

(iv) injecting the particulate solid carbonaceous material feed stream and carrier gas from the solids feed inlet into the mixing region to form a resultant turbulent mixture of the particulate source of heat, the particulate solid carbonaceous material particles and carrier gas;

(v) passing the resultant turbulent mixture downwardly from said mixing zone to the pyrolysis zone of said pyrolysis reactor to pyrolyze the solid carbonaceous material particles and yield a pyrolysis product stream containing as particulate solids, the particulate source of heat and a carbon containing solid residue of pyrolysis of the particulate solid carbonaceous material, and a vapor mixture of carrier gas and pyrolytic vapors comprising volatilized hydrocarbons including tars;

(c) passing the pyrolysis product stream from said pyrolysis reactor to a separation zone to separate at least the bulk of the particulate solids from the vapor mixture; and

(d) forming the particulate source of heat by:

(i) transporting the separated particulate solids from the separation zone to an oxidation-separation zone comprising at least two cyclone separation stages in series with a transport gas containing free oxygen with resultant carbon monoxide formation from the carbon in the particulate solids; and

(ii) combining the transported particulate solids, carbon monoxide and transport gas in the first cyclone separation stage with a source of free oxygen in an amount at least equal to 50 mole percent of the carbon monoxide entering the oxidation stage, the total free oxygen in the transport gas and combined in the first cyclone separation stage being sufficient to raise the solids to a temperature above the temperature of the pyrolysis zone while simultaneously separating the bulk of the particulate source of heat from the gases in the first cyclone-separation stage to form the feed to the substantially vertically oriented chamber, the residence time in said first cyclone stage being less than about 5 seconds, and separating a fines fraction of the particulate source of heat from the gases in the remaining cyclone separation stages.

4,102,774
SEPARATION OF SOLIDS FROM COAL LIQUIDS USING AN ADDITIVE

Norman L. Carr, Allison Park, and Edgar L. McGinnis, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,047
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 **17 Claims**

10. The process of claim 9 wherein said solids-liquid separation step is a filtration step.

4,102,775
CONVERSION PROCESS FOR SOLID, HYDROCARBONACEOUS MATERIALS

George J. Quarderer, Midland, and Norman G. Moll, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1977, Ser. No. 824,770
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **9 Claims**

1. A process for the conversion of a solid, hydrocarbona-

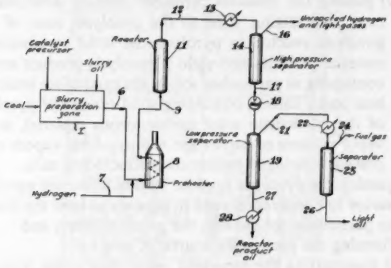
ceous material to valuable liquid and gaseous products, the process comprising:

(a) preparing a slurry from a slurry oil, a hydrogenation catalyst and the hydrocarbonaceous material;

(b) admixing hydrogen with the slurry;

(c) hydrogenating the hydrocarbonaceous material to liquid and gaseous hydrogenation products, the liquid hydrogenation product containing suspended particles of ash and hydrogenation catalyst;

(d) gravitationally separating the liquid hydrogenation product into a first stream and a second stream, the first stream having both a lower ash concentration than the liquid hydrogenation product and a greater catalyst:ash ratio than the second stream;



(e) recycling at least a portion of the first stream for use as at least a portion of the slurry oil in the slurry preparation and thereby recycling at least a portion of the catalyst;

(f) extractively separating with a solvent the second stream into a third stream and a fourth stream, the third stream containing essentially no ash and the fourth stream containing essentially all of the ash of the second stream;

(g) recycling at least a portion of the third stream for use as at least a portion of the slurry oil in the slurry preparation; and

(h) recovering valuable liquid and gaseous products from the hydrogenation products.

4,102,776

MOVING BED CONTACTING PROCESS

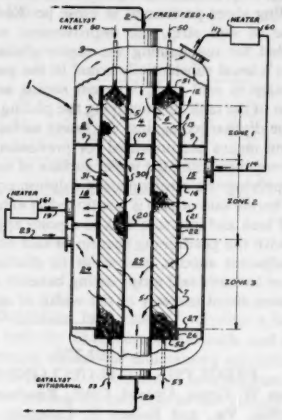
Richard D. Stone, Deerfield, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 625,418, Oct. 24, 1975, Pat. No. 4,040,794. This application Apr. 1, 1977, Ser. No. 783,923

Int. Cl.[2] C10G *35/10*

U.S. Cl. 208—64 **17 Claims**

1. A process for hydrocarbon conversion of a hydrocarbon comprising contacting said hydrocarbons at hydrocarbon conversion conditions with a single vertical moving bed of catalyst particles disposed as a plurality of reaction zones which are vertically spaced along the vertical length of the moving bed; said zones contained in an apparatus comprising a vertically elongated pressure tight vessel; a pair of vertical, concentric, inner and outer perforated screens positioned intermediate the axis of said vessel and the outer wall thereof and defining an annular conduit filled with catalyst, said conduit including a plurality of apertures at its upper and lower ends through which apertures active catlyst is added to the top of said catalyst bed and spent catalyst is removed from its bottom, said apertures being connected to tubes which pass through the top and bottom of said vessel, a plurality of vertical, tubular inner and outer baffle members arranged in opposed relation at spaced locations along the length of said conduit for preventing the radial flow of hydrocarbon through said catalyst bed; a plurality of inner and outer horizontal baffle members affixed to at least some of said vertical baffle members for limiting the extent of axial flow of fluid through inner flow chambers defined by the hollow cylindrical space within said inner perforated screen and outer flow chambers defined by the hollow annular space between said outer perforated screen and the outer wall of the vessel, said horizontal baffles and said vertical baffles cooperating with each other and with the wall of the vessel to divide said vessel into a plurality of separate zones; fluid inlet and outlet means for each of said zones passing through the walls of said vessel, the inlet means for each of said zones being connected to one of the inner and outer flow chambers for the zone and the outlet means for each of said



zones being connected to one of the inner and outer flow chamber for the zone, whereby at least the major portion of fluid passing through each zone will be forced to travel radially through the catalyst bed.

2. Process of claim 1 wherein the fluid is a naphtha, reforming conditions and a reforming catalyst are used, and a reformate is recovered.

4,102,777

HYDROCARBON CONVERSION PROCESSES EMPLOYING PEROVSKITE CATALYSTS

Kenneth S. Wheelock, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 676,511, Apr. 13, 1976, Pat. No. 4,055,513. This application May 4, 1977, Ser. No. 793,854

Int. Cl.[2] C10G *11/04, 13/04;* B01J *8/24*

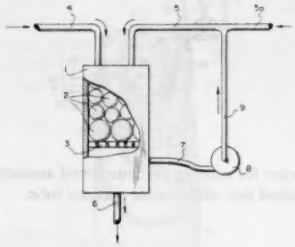
U.S. Cl. 208—121 **14 Claims**

1. A hydrocarbon conversion process conducted under hydrocarbon conversion conditions in the presence of a supported perovskite catalyst, which catalyst comprises a perovskite comprising at least one transition metal, and a support comprising a metal oxide and a spinel on the surface of said metal oxide, said spinel being selected from the group consisting of normal spinel and inverse spinel, said normal spinel having an empirical formula MY_2O_4 wherein M and Y in said normal spinel formula are cations of different metals and wherein one of said cations of said normal spinel formula is the metal of said metal oxide, said inverse spinel having an empirical formula $Y(XY)O_4$ wherein Y and X in said inverse spinel formula are cations of different metals, and wherein one of said cations of said inverse spinel formula is a metal of said metal oxide, said supported catalyst having a surface area of at least 65 m^2/g.

4,102,778
METHOD AND APPARATUS FOR CARRYING OUT HYDROGENATION REACTIONS

John A. Ruether, Les Bisets 153, Rue de Verviers, 54500 Vandoeuvre, France

Filed Apr. 9, 1976, Ser. No. 675,342
Claims priority, application Canada, Apr. 10, 1975, 224274
Int. Cl.[2] C10G *23/02, 23/16*
U.S. Cl. 208—143 4 Claims



1. A method for carrying out hydrogenation which comprises the steps of

introducing a liquid hydrocarbon material into a reactor at a first predetermined rate,

introducing hydrogen gas into the reactor at a second predetermined rate,

permitting the liquid hydrocarbon material and the hydrogen gas to mix,

causing the mixed liquid hydrocarbon material and hydrogen gas to pass in close association with a layer of solid catalyst particles held in place in said reactor,

the individual structure of solid catalyst particles characterized by providing an inert support member coated with a thin layer of catalytically active material, and

removing the hydrogenated product so produced from the reactor;

the said first predetermined rate being such that the superficial velocity of liquid hydrocarbon in the reactor is in the range of 0.5–6 cm/sec. and the liquid hourly space velocity, based on the volume by said catalytically active microporous solid, is in the range of 25 – 1000 hr^{-1}; and

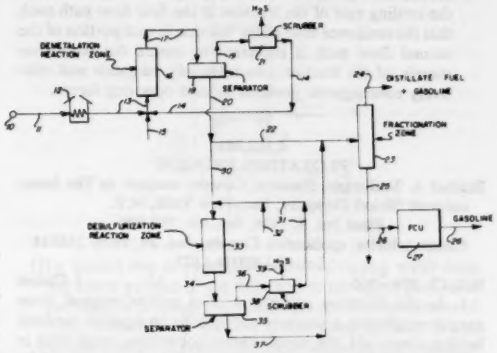
the said second predetermined rate being such that the superficial velocity of hydrogen gas in the reactor is in excess of 30 cm/sec.

4,102,779
PROCESSES FOR TREATING A HEAVY PETROLEUM HYDROCARBON STREAM CONTAINING METALS AND ASPHALTENES

Albert L. Hensley, Jr., Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 13, 1976, Ser. No. 714,338
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—211 12 Claims

7. A process for treating a heavy hydrocarbon stream containing metals and asphaltenes and being a member selected from the group consisting of a petroleum hydrocarbon residuum, a hydrocarbon stream derived from tar sands, and a hydrocarbon stream derived from coal, which process comprises in sequence the steps of: (a) contacting in a first reaction zone said heavy hydrocarbon stream in the presence of hydrogen and under suitable operating conditions with a first catalyst existing as a particulate material of 1/32-inch or larger particles in a fixed bed or ebullated bed of said particles and comprising a hydrogenation component deposed on a large-pore, high-surface area silica gel to produce a first effluent that contains quantities of metals and asphaltenes that are smaller than those in said heavy hydrocarbon stream, said hydrogenation component of said first catalyst consisting essentially of a metal of Group VIB of the Periodic Table of Elements or a metal of Group VIII of the Periodic Table of Elements and being present in the elemental form, as an oxide, as a sulfide, or combinations thereof, the amount of said metal of Group VIB, when present, being about 0.1 wt.% to about 20 wt.% and the amount of said metal of Group VIII, when present, being about 0.1 wt.% to about 5 wt.%, calculated as the metal and based on the weight of the catalyst, said silica gel having a surface area of about 100 square meters per gram to about 600 square meters per gram, an average pore diameter of about 80 A to about 300 A, and a pore volume of about 0.5 cubic centimeter per gram to about 1.5 cubic centimeters per gram, said

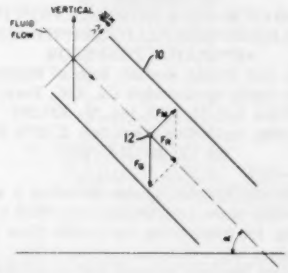


surface area, said average pore diameter, and said pore volume being those of the fresh silica gel, said operating conditions comprising a temperature of about 700° to about 900° F., a hydrogen partial pressure of about 400 psia to about 2,500 psia, a LHSV of about 0.1 to about 5 volumes of hydrocarbon per hour per volume of catalyst, and a hydrogen recycle rate of about 1,000 SCFB to about 10,000 SCFB; and (b) contacting at least a portion of said first effluent in a second reaction zone at elevated temperature and elevated pressure and in the presence of hydrogen with a second catalyst to obtain a desulfurized effluent, said second catalyst being a suitable desulfurization catalyst.

4,102,780
METHOD AND APPARATUS FOR MAGNETIC SEPARATION OF PARTICLES IN A FLUID CARRIER

Jack Ji-Nong Sun, and Dartrey Lewis, both of Trenton, N.J., assignors to S. G. Frantz Company, Inc., Trenton, N.J.

Filed Mar. 9, 1976, Ser. No. 665,265
Int. Cl.[2] B03C *1/30*
U.S. Cl. 209—39 22 Claims



1. A method for separating a mixture of diverse-size particles in accordance with the magnetic susceptibilities of the particles, comprising:

flowing a fluid carrier upward through a first flow path in opposition to the settlement of the particles suspended therein due to gravity;

adjusting the upward rate of flow of the fluid carrier in said first path to select from said mixture a fraction of particles of a substantially uniform settling rate in the fluid carrier;

flowing said fraction suspended in the fluid carrier from the first flow path to a second flow path;

applying opposing magnetic and nonmagnetic forces to said fraction over at least a portion of said second flow path; and

in response to said flow adjustment in the first flow path, adjusting the fluid flow rate through the second flow path so as to pass said fraction through said portion of the second flow path at a velocity proportionally related to the settling rate of the fraction in the first flow path such that the residence time of the fraction in said portion of the second flow path is sufficient to enable the separation therein of the fraction into relatively magnetic and relatively nonmagnetic portions by said opposing forces.

4,102,781

FLOTATION PROCESS

Reichel A. Tenbergen, Hanmer, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

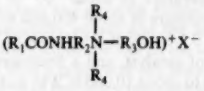
Filed Jul. 8, 1976, Ser. No. 703,509

Claims priority, application Canada, Jan. 30, 1976, 244644

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **5 Claims**

1. In the flotation separation of a sulfide mineral from gangue employing a xanthate collector in an aqueous medium having a basic pH, the improvement comprising employing in association with said xanthate collector a material defined by the formula



wherein

R_1 is an aliphatic or alicyclic radical containing at least 7 and up to about 20 carbon atoms

R_2 is a moiety selected from the group of methylene, ethylene, propylene and butylene radicals

R_3 is a moiety selected from the group of ethylene and propylene radicals

R_4 is an aliphatic radical containing from 1 to 3 carbon atoms and

X is a monavalent anion compatible in an ore pulp in an amount effective to enhance the separation of said sulfide mineral from said gangue.

4,102,782

METHOD OF SAMPLE INTRODUCTION IN THE MICRO LIQUID CHROMATOGRAPHY AND THE APPARATUS THEREFOR

Muneo Saito, and Hideki Konishi, both of Hachioji, Japan, assignors to Japan Spectroscopic Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1977, Ser. No. 829,296

Claims priority, application Japan, Sep. 2, 1976, 51-105345

Int. Cl.[2] B01D *15/08*

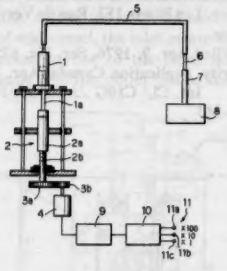
U.S. Cl. 210—31 C **8 Claims**

7. In a chromatographic system including a syringe for retaining a mobile phase, a connecting tube which is connected to said syringe for transporting the mobile phase discharged from said syringe into a chromatographic column, and a sample retainer tube disposed between said connecting tube and said column, a sample introducing apparatus for a micro-liquid-chromatography comprising

(a) a detachable connection mechanism employed between said column and said sample retainer tube;

(b) a driving mechanism with a pulse-motor, being capable of positive and inverse rotation, for reciprocating a piston in said syringe in the axial direction thereof; and

(c) a mechanism for imparting predetermined number of pulses to said pulse-motor in order to inversely rotate said



pulse-motor for causing predetermined amount of sample to be sucked into said sample retainer tube.

4,102,783

ADSORBENT PROCESS FOR OILY MATERIALS

Akira Zenno; Toshiaki Uebayashi, both of Himeji; Isamu Maruyama, Tatsuno, and Hidehiro Shiono, Himeji, all of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Dec. 8, 1976, Ser. No. 748,445

Claims priority, application Japan, Dec. 8, 1975, 50-146597; Mar. 27, 1976, 51-33833; Jun. 24, 1976, 51-75168

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—36 **20 Claims**

1. A process for treating oil-containing waste water which comprises treating the oil-containing waste water with an oil adsorbent comprising unrefined crude lints or crude linters, said crude lints and crude linters containing about 0.3 to about 3% by weight cotton wax.

4,102,784

COLLOID FREE PRECIPITATION OF HEAVY METAL SULFIDES

Richard M. Schlauch, 29 Gerard Rd., Yardville, N.J. 08620

Continuation-in-part of Ser. No. 680,553, Apr. 27, 1976, abandoned. This application May 23, 1977, Ser. No. 799,699

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—47 **8 Claims**

1. A method of precipitating heavy metal pollutant ions from aqueous solution, comprising:

(a) forming an aqueous solution of a water soluble sulfide;

(b) adding a water soluble ferrous salt in the presence of sufficient base to maintain the pH above 7 thru the entire precipitating process, to the thus formed sulfide solution, to form a large particle size slurry of ferrous sulfide precipitate having a higher equilibrium sulfide ion concentration than the sulfide of the heavy metal pollutant in said aqueous solution;

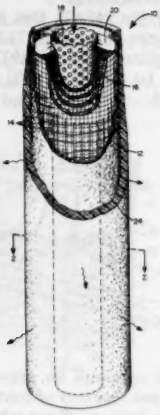
(c) adding said slurry of (b) in the presence of a polyelectrolyte, to the aqueous solution containing dissolved heavy metal pollutant ions to form a colloid free metal ion precipitate;

(d) removing said precipitate.

4,102,785
INSIDE-TO-OUTSIDE FLOW FILTER TUBE AND METHOD OF USING SAME

Brian Arthur Head, Maidstone, England, and Philip C. Kimball, Andover, Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England

Continuation of Ser. No. 679,569, Apr. 23, 1976, abandoned.
This application Jun. 3, 1977, Ser. No. 803,408
Int. Cl.² B01D *37/00*
U.S. Cl. 210—65 **28 Claims**



21. An inside-to-outside flow filter tube of improved burst strength, which filter tube comprises:

(a) a plurality of randomly disposed, nonwoven glass fibers having a diameter of from about 0.01 to 8 microns, and having interstices therebetween, the fibers bonded together into a self-supporting filter tube by a hardened resin bonding agent at the junction of the fiber crossover points to form a filter tube wall; and

(b) an open scrim sheet material of glass fibers having openings of about ¼ to 1 inch and embedded within said filter tube wall, with no scrim material extending to the external filter tube wall, the scrim material extending generally the length of the filter tube and from about one and one-half to five revolutions about the tube diameter, the scrim material formed into a generally noncontaining helical scroll, with a layer of glass fibers of selected depth separating each convoluted layer of scrim material, the glass fibers bonded cooperatively with and through the scrim material by the bonding agent, to form a continuous, integrally bonded filter tube wall of the glass fibers, said filter tube having an average burst strength of greater than about 52 P.S.I.

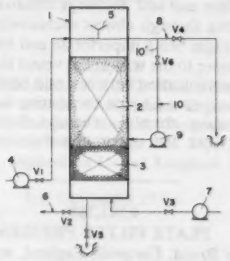
4,102,786
METHOD FOR CLEANING OF FILTER DEVICE

Hiroo Okada, Sagamihara; Moriyuki Hirota, Yamato, and Masaaki Uesugi, Yokohama, all of Japan, assignors to Kurita Water Industries Limited, Osaka, Japan

Filed Jan. 25, 1977, Ser. No. 762,280
Claims priority, application Japan, Jan. 26, 1976, 51-6607
Int. Cl.² B01D *23/24*
U.S. Cl. 210—80 **6 Claims**

1. In a process for the washing of a filter bed composed of an upper layer formed of filtering grains of synthetic resin and a lower layer formed of filtering grains of sand which layers retain insoluble matter therein in a filter device for causing a downward current of raw water to flow through the filter bed, the improvement which comprises:

(1) a first step of causing a current of washing water to flow upward from the lower portion of the filter bed at a velocity high enough for the current of water to entrain at least part of the filtering grains, then allowing the current of water entraining filtering grains to flow out of the filter device from the upper portion thereof, subsequently forwarding the discharged current of water in conjunction with the entrained filtering grains to the filter bed and repeating the circulation of the filtering grains for thereby stirring the filtering grains and freeing the filtering grains of the insoluble matter retained therein,



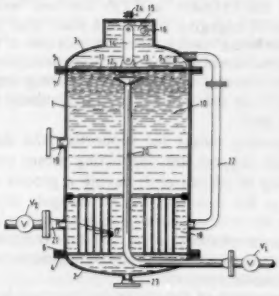
(2) a second step of passing a current of rinsing water from the lower portion of the filter bed to the upper portion of the same at a velocity not high enough for the current of water to entrain the filtering grains out of the filter device for thereby giving the filter bed a backwashing treatment for removing the insoluble matter and

(3) a third step of ceasing the backwashing treatment for thereby rearranging the upper and lower layers of the filter bed by the specific gravity difference therebetween.

4,102,787
APPARATUSES TO SEPARATE MIXTURES OF LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES

Alfonsus Antonius Geurtsen, Schalkhaar, Netherlands, assignor to Machinefabriek Geurtsen Deventer, B.V., Deventer, Netherlands

Continuation of Ser. No. 548,905, Feb. 11, 1975, abandoned.
This application Jul. 16, 1976, Ser. No. 705,924
Claims priority, application Netherlands, Feb. 18, 1974, 7402216
Int. Cl.² B01D *21/24*
U.S. Cl. 210—104 **5 Claims**



1. An apparatus to separate a mixture of non-miscible liquids of different specific gravities, e.g. oil and water, said apparatus comprising a closed vessel, a flexible diaphragm forming a partition within said vessel to provide a separation space in said vessel below said diaphragm and an upper chamber in said vessel above said diaphragm and said separation space and intended to be entirely filled, during operation, with the heavier liquid component of the mixture, said flexible dia-

phragm being mounted for vertical movement in said vessel between two end positions for controlling the flow of liquids through the apparatus a conduit for the supply of mixture to be separated opening into the separation space, a conduit for the discharge of lighter liquid connected to the separation space on a level just below the lowest position of the partition, a discharge conduit for the heavier liquid connected to the lower portion of said vessel and at least one filter provided between the lower part of the separation space and said discharge conduit to provide a collecting chamber for the heavier liquid between said filter and said discharge conduit, said filter being capable of letting through almost exclusively the heavier liquid, said diaphragm being imperforate and being attached in a liquid tight manner to the wall of the vessel thereby preventing said direct communication between said separating space and said upper chamber, and a pipe connecting the upper chamber with the collecting chamber whereby the separation space communicates with the upper chamber only through said filter.

4,102,788

PLATE FILTER PRESSES

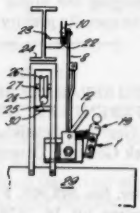
Bernard Henry Broad, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

Continuation of Ser. No. 433,703, Jan. 16, 1974, abandoned. This application Sep. 30, 1976, Ser. No. 728,290

Claims priority, application United Kingdom, Jan. 16, 1973, 2329/73

Int. Cl.[2] B01D *25/32;* **B30B** *9/04*

U.S. Cl. 210—230 **6 Claims**



1. An apparatus suitable for shifting the plates of a plate filter press, which apparatus comprises:

(a) a manually-operable, power-drivable device which includes (i) a piston and cylinder arrangement in which the piston is reciprocatable under power along a line of action within the cylinder, and (ii) first and second members capable of engaging plates of a plate filter press, the first member being rigidly mounted on a rod of the piston and the second member being rigidly mounted on the cylinder, and the first and second members being disposed perpendicularly or substantially perpendicularly to the line of action; and

(b) supporting means for supporting the device from an elongate support, the supporting means comprising (i) a plurality of wheels each having a groove around its periphery, for mounting on an elongate support, and (ii) means for holding the wheels in spaced relationship from the device whereby, in use, the device can hang below the elongate support and the apparatus can be pivoted around the elongate support;

the arrangement of the apparatus being such that, in use of the apparatus and with the supporting means supported from the elongate support disposed parallel to a plate filter press, the apparatus can be pivoted with respect to the elongate support to bring the first and second members into and out of engagement with plates of the plate filter press and, when so in engagement, the device can be operated to cause movement of the piston and first member relative to the cylinder and second member and hence movement of one or more plates of the plate filter press; and the arrangement of the supporting means being such that the supporting means is readily detachable from an elongate support, whereby the apparatus may be readily transferred to an elongate support associated with another plate filter press.

4,102,789

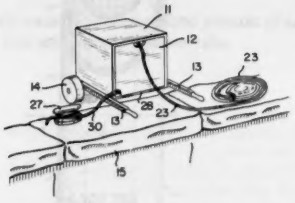
HYDRO-CARPET OIL SPILLAGE CONTAINMENT AND RECOVERY DEVICE

Richard W. Young, Edison, N.J., assignor to Amerada Hess Corporation, Woodbridge, N.J.

Continuation of Ser. No. 747,679, Dec. 6, 1976, abandoned, which is a continuation of Ser. No. 572,538, Apr. 28, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,570

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—252 AS **3 Claims**



1. A hydro-carpet apparatus for providing for the downstream containment and recovery of contaminants of oil spills and the like resulting from overflows when making a transfer of such oil materials between a floating vessel and storage means, with the transfer occurring after the vessel is brought substantially adjacent to a dock surface, said apparatus comprising:

a compactly storable and manually pullable and incrementally dispensable elongate floatable hydro-carpet for the downstream containment and recovery of contaminants of oil spills and permitting emergency deployment by only one person;

a manually pullable roller for maintaining said hydro-carpet in compact form and adapted to be turned under manual pulling force by only one person so that the hydro-carpet may be manually rapidly unrolled therefrom;

a container having an opening closed by an openable door and containing said hydro-carpet manually rapidly removably maintained therein in compact form on said roller, said door being pivotably operable by the force exerted by the outward removal thereat of the hydro-carpet and roller together from the container under manual pulling force by only one person;

a docking securing line secured to one end of said hydro-carpet for securing said one end of the hydro-carpet to the dock while the hydro-carpet is still maintained in compact form in said container, and

a vessel securing elongated manually pullable messenger line secured operatively to the other end of said hydro-carpet through said roller for securing said other end of the hydro-carpet to the downstream end of the vessel and of sufficient length for such securing while the hydro-carpet is still maintained in compact form on said roller in said container, so that the hydro-carpet and roller can be manually rapidly removed from the container and dropped together onto the surface upon which the vessel is floated by manually pulling on the messenger line by only one person and so that the hydro-carpet, after removal and while still being so secured, can in turn be rapidly unrolled from the roller on the surface upon which the vessel is floated and simultaneously be incrementally dispensed across such surface by further manual pulling on such messenger line by only one person, thereby to preclude thereat contaminants resulting from losses during the

transfer from floating over the surface beyond the dock and the region where the hydro-carpet is secured to the vessel;

a yoke for operatively carrying the roller, said messenger line being secured to the roller through the yoke for pulling the roller via the yoke along the surface upon which the vessel is floated to unroll the hydro-carpet onto and across such surface as the roller is pulled along such surface.

4,102,790

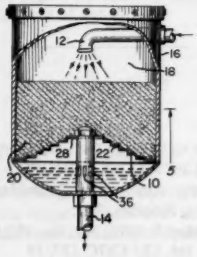
FILTER UNDERDRAIN

Raymond E. Portyrata, North Haven, Conn., assignor to Diaclear, Inc., Hamden, Conn.

Filed Aug. 18, 1976, Ser. No. 715,752

Int. Cl.² B01D *23/18*

U.S. Cl. 210—293 **7 Claims**



1. A filter underdrain especially for use with a granular filtering medium comprising:

(a) a plate having an inverted dished configuration, said plate defining a plurality of laterally facing slots arranged individually in a horizontally extending spiral array therein; and

(b) a plurality of upper edges and associated lower edges, each said upper edge and said lower edge cooperating to define one of said slots, said upper edges being positioned approximately directly above said associated lower edge to face said slot laterally horizontally outward from the center of said plate in order to impart a turbulent mixing action to a granular filtering medium during backwashing.

4,102,791

DOUBLE DRUM VACUUM FILTER

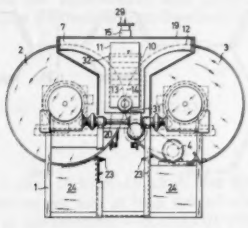
Wilhelm Otte, Bochum, Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Oct. 7, 1976, Ser. No. 730,679

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545030

Int. Cl.² B01D *33/06*

U.S. Cl. 210—326 **1 Claim**



1. A double drum filter assembly comprising:

a pair of oppositely rotating foraminous surfaced drums, means for adjusting the spacing between the drum axes, the foraminous surfaces being spaced to provide a slight gap therebetween which is capable of being bridged by solid particles from the suspension being filtered, and

baffle plates connecting the faces of said drums together, whereby said drums retain a constant operating diameter as filtration proceeds and the deposited particles form a seal between said drums.

4,102,792

DISPOSABLE FILTER ELEMENT

Frank John Turner Harris, Cheltenham, England, assignor to Evans, Adlard & Company Limited, Cheltenham, England

Filed Nov. 16, 1976, Ser. No. 742,173

Claims priority, application United Kingdom, Nov. 20, 1975, 47753/75

Int. Cl.² B10D *27/06*

U.S. Cl. 210—457 **12 Claims**

1. A disposable filter element for fluids comprising a ring of pleated permeable filter sheet material provided with continuous parallel lines of corrugations which extend continuously along the filter sheet material and at right angles to the fold lines of the pleats, wherein a proportion of the lines of corrugations have major corrugations with a height which is greater than that of the corrugations in the other lines of corrugations, whereby major corrugations in adjoining walls of adjacent pleats serve to space them apart.

4,102,793

HEAT-RESISTANT FIBER CONDITIONING AGENTS

Ulrich Cuntze, Hofheim, Taunus; Gustav Dollinger, Egelsbach; Rolf Kleber, Neu-Isenburg, and Hans-Jerg Kleiner, Kronberg, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

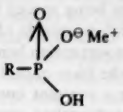
Filed Apr. 20, 1976, Ser. No. 678,700

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518124

Int. Cl.² C09K *3/28*

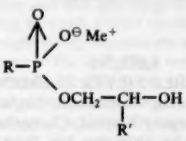
U.S. Cl. 252—8.1 **1 Claim**

1. Aqueous mixtures containing an alkane-phosphonic acid salt of the formula I



I

and an alkane-phosphonic acid-semi-ester salt of the formula II



II

in a molar ratio of from 19:1 to 5:1, R being an unbranched saturated alkyl radical having from 6 to 12 carbon atoms, R′ being hydrogen or methyl, and Me^+ standing for Li, Na or K.

4,102,794

FIREPROOFING MATERIALS

Giuseppe Gandini, Brescia, and Luigi Frignoli, Milan, both of Italy, assignors to Luigi Frignoli, Brescia; Ermanno Savio, Milan; Sergio Calamani, Milan and Eugenio Turri, Milan, all of Italy

Filed Jul. 20, 1977, Ser. No. 817,213
Claims priority, application Italy, Jul. 21, 1976, 25563 A/76; Sep. 17, 1976, 27324 A/76
Int. Cl.² C09K *3/28*
U.S. Cl. 252—8.1 10 Claims

1. A composition for fireproofing materials of various kind, consisting of an aqueous solution containing in the solution at least three ions selected from the group including ammonium, zinc, bromine, chlorine ions, alkaline-earth metal ions and phosphate ions.

4,102,795

SOFTENER COMPOSITION FOR FABRICS OR HAIR

Yutaka Minegishi, Miyashiro, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,408
Claims priority, application Japan, Apr. 30, 1976, 51-50363
Int. Cl.² D06M *13/18*
U.S. Cl. 252—8.9 9 Claims

1. A composition for softening fabrics or hair, said composition being an aqueous solution or dispersion consisting essentially of (A) from 3 to 20 percent by weight of a cationic amine derivative or mixture of said derivatives, said derivatives having in the molecule one or two alkyl groups having 11 to 22 carbon atoms, or one or two β-hydroxyalkyl groups having 13 to 24 carbon atoms, said derivatives being capable of softening fabric or hair, (B) 0.005 to 1.0% by weight of a water-soluble polyoxyalkylene derivative obtained by reacting an adduct of 20 to 300 moles of ethylene oxide, propylene oxide or mixture thereof to a compound selected from the group consisting of monohydric alcohols, monothiol mercaptans and alkylphenols each having a total carbon atom number of from 12 to 26, with a diepoxide compound in an amount of 0.5 to 5 equivalents of said diepoxide compound per one equivalent of said adduct and (C) the balance of the composition is essentially water.

4,102,796

LUBRICATING OIL ANTIOXIDANT ADDITIVE COMPOSITION

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 672,805
Int. Cl.² C10M *1/12*; C09K *15/02*
U.S. Cl. 252—47.5 2 Claims

1. An additive composition for use in crankcase lubricating oils comprising:
   1. an oil-soluble antioxidant selected from aromatic and alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and
   2. dicocoamine.

2. The composition of claim 1 comprising an oil of lubricating viscosity, from 0.25 to 10% weight of said antioxidant and from 0.001 to 5% weight of said dicocoamine.

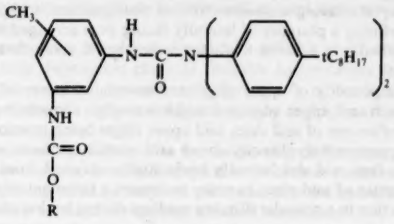
4,102,797

COMPOUNDS CONTAINING BOTH UREA AND URETHANE GROUPS

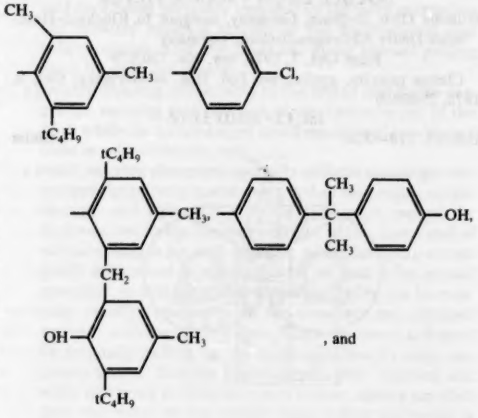
Hendrik Schadenberg, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 3, 1976, Ser. No. 682,539
Int. Cl.² C07C *127/19*
U.S. Cl. 252—51.5 A 8 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of:



7. A composition comprising a major proportion of a lubricating oil and an oxidation stabilizing amount of a compound as in claim 1.

4,102,798

OXAZOLINE ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

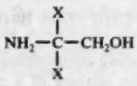
Jack Ryer, East Brunswick; James Zielinski, Somerset; Harold N. Miller, Millington, and Stanley J. Brois, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 455,250, Mar. 27, 1974, abandoned. This application Jul. 27, 1976, Ser. No. 708,925

Int. Cl.[2] C10M *1/32*

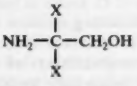
U.S. Cl. 252—51.5 A **31 Claims**

1. A lubricating oil composition comprising: a major amount of lubricating oil and 0.01 to 20 wt. % of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having more than 50 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



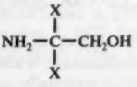
wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140° to 240° C for about ½ to 24 hours with the removal of about three molar proportions of water.

5. An additive concentrate comprising: a major amount of mineral lubricating oil in the range of 98 to 45 parts by weight, 2 to 45 parts by weight of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having more than 50 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



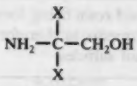
wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140° to 240° C for about ½ to 24 hours with the removal of about three molar proportions of water.

9. An oil-soluble, oxazoline reaction product obtained from heating together a molar equivalent of a hydrocarbon substituted C_4–C_{10} dicarboxylic acid material having more than 50 carbon atoms per dicarboxylic acid group, and two molar equivalents of a 2,2-disubstituted-2-amino-1-alkanol having the formula



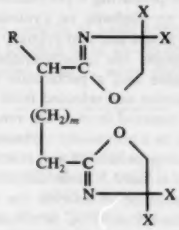
wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3 at a temperature of from 140°–240° C. until cessation of water evolution indicating completion of the oxazoline reaction.

14. A bisoxazoline reaction product prepared by the reaction of a molar proportion of a hydrocarbon substituted C_4–C_{10} dicarboxylic acid material having more than 50 carbon atoms per dicarboxylic acid group and two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having the formula



wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3 at a temperature of from 140°–240° C. until cessation of water evolution indicating completion of the oxazoline reaction.

18. A bis-oxazoline of the general formula



where X is an alkyl or hydroxy alkyl group said alkyl groups having 1 to 3 carbon atoms with at least one of the X substituents on each ring being a hydroxy alkyl group of the structure $—(CH_2)_nOH$ wherein n is 1 to 3 and R is a substantially saturated hydrocarbyl group containing at least 50 carbon atoms and m is from 0 to 6.

4,102,799

AUTOMATIC DISHWASHER DETERGENT WITH IMPROVED EFFECTS ON OVERGLAZE

Patricia A. Finck, Bayonne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 501,720, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 335,461, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 133,337, Apr. 12, 1971, abandoned. This application Mar. 5, 1976, Ser. No. 664,337

The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.

Int. Cl.[2] C11D *7/54*

U.S. Cl. 252—99 **3 Claims**

1. An alkaline dishwahser detergent capable of inhibiting overglaze attack and essentially free of inorganic phosphates consisting essentially of, (A) as the sole builder components, about 35–60% by weight of a water soluble hydrated citrate compound, alone or in admixture with a water soluble anhydrous citrate compound and about 30–65% by weight of at least one water soluble inorganic builder salt selected from the group consisting of silicates having an SiO_2 to Na_2O ratio from 1:1 to 3.2:1, carbonates and sulfates, (B) about 2.46 to 6% by weight of boric acid and (C) about 0.5 to 5% by weight of bleaching agent capable of liberating hypochlorite or hypobromite, said composition having a pH in water of from 9.5 to 12.

4,102,800

MICROENCAPSULATED VULCANIZING AGENTS

Ivan Christoff Popoff, Ambler, Pa., and Chester Blair DeSavigny, Bryan, Tex., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 1, 1973, Ser. No. 402,215

Int. Cl.[2] B01J *3/00*

U.S. Cl. 252—182 **4 Claims**

1. An improved vulcanizing agent comprising alkylated

phenol sulfides wherein the alkyl groups of the sulfide are from 1 to 18 carbon atoms contained within a microcapsule in which the capsule wall is crosslinked polyamide, polyurea, or polyamide-polyurea resin, said resin being formed in situ by condensation of reactive intermediates therefor during encapsulation of said alkylated phenol sulfides.

4,102,801

PROCESS FOR MAKING POLYAMINE CARBAMATES

Nicolas Brodoway, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1977, Ser. No. 780,908

Int. Cl.[2] C09K *3/00*; C01B *21/12*; B01J *31/02*

U.S. Cl. 252—182 **13 Claims**

1. In a process for preparing a polyamine carbamate which comprises reacting an aliphatic or cycloaliphatic polyamine having 2–14 carbon atoms and two primary amino groups with gaseous carbon dioxide, the improvement which comprises mixing said polyamine and a particulate carrier capable of adsorbing the polyamine and selected from the group consisting of an inorganic material inert to the reaction of polyamine with carbon dioxide or a polyamine carbamate that is the same as the carbamate being produced and reacting the polyamine on the carrier with at least 1 mole carbon dioxide per mole polyamine in the absence of solvent for the reactants at a temperature less than about 90° C to obtain the free-flowing, corresponding polyamine carbamate-carrier mixture.

2. A process of claim 1 wherein the carrier is a polyamine carbamate that is the same as the carbamate being produced.

3. A process of claim 1 wherein the carrier is an inorganic material inert to the reaction of polyamine with carbon dioxide.

4. A process of claim 3 wherein the carrier is silica.

13. A process of claim 1 wherein the reaction is carried out in the presence of an anti-dusting agent for the resulting carbamate that is a hydrocarbon oil or fibrillated poly(tetrafluoroethylene).

4,102,802

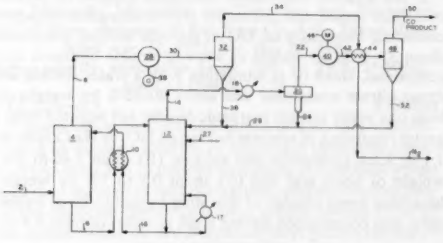
PROCESS FOR SEPARATION AND RECOVERY OF CARBON MONOXIDE

Marvin M. Johnson, and Donald C. Tabler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 618,721, Oct. 1, 1975, Pat. No. 4,042,669. This application Apr. 27, 1977, Ser. No. 791,443

Int. Cl.[2] C10K *1/32*; B01D *19/04*

U.S. Cl. 252—184 **12 Claims**



1. A composition of matter suitable for the absorption of carbon monoxide from a gas mixture containing same which consists essentially of a normally liquid hydrocarbon diluent having a boiling point in the approximate range of 60° to 150° C and at least one copper(I) salt selected from the group consisting of

(a) the copper(I) salt of an alkane sulfonic acid having from 4 to 20 carbon atoms per molecule;

(b) an aromatic sulfonic acid having from 6 to 22 carbon atoms per molecule;

(c) the copper(I) salt of a petroleum sulfonate acid; and

(d) the copper(I) salt of a dialkyl phosphoric acid having from 1 to 12 carbon atoms per alkyl member; wherein said copper(I) salt is present in said diluent in an amount ranging from 0.1 to 2 moles per liter of said diluent.

4,102,803

OXYGEN-CONSUMING COMPOSITION

Daishiro Fujishima, and Shinichiro Fujishima, both of Sagamihara, Japan, assignors to Mitsubishi Shoji Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 524,987, Nov. 18, 1974, abandoned. This application Oct. 27, 1976, Ser. No. 736,245

Claims priority, application Japan, Dec. 27, 1973, 49-144482; Jan. 7, 1974, 49-5177

Int. Cl.[2] C01B *17/66*; B01D *53/14*

U.S. Cl. 252—188 **11 Claims**

1. An oxygen-consuming composition comprising a substantially dry homogeneous mixture of a particulate porous gas absorbing filler and an alkaline material having a dithionite uniformly dispersed therethrough, said alkaline material being present in a stoichiometric ratio of at least about 7.5:1 and being selected from the group consisting of alkaline hydroxides and carbonates.

4,102,804

INHIBITOR FOR GAS CONDITIONING SOLUTIONS

Robert C. Clouse, and Robert G. Asperger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 782,156

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—189 **13 Claims**

1. A sour gas conditioning solution inhibited against CO_2 promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part by weight of a quaternary pyridinium salt and about 0.001–10 parts of a thio compound which is a water-soluble thiocyanate, a water-soluble sulfide, or an organic thioamide.

4,102,805

CATHODOLUMINESCENT AND PHOTOLUMINESCENT GLASSES

Mary S. Mizzoni, and Richard F. Reade, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1977, Ser. No. 773,201

Int. Cl.[2] C03C *3/28, 3/04*

U.S. Cl. 252—301.4 F **5 Claims**

1. An essentially crystal-free, transparent glass article emitting a strong bluish luminescence when excited by ultraviolet or cathode rays consisting essentially, in terms of mole percent on the oxide basis, of about 15–30% Al_2O_3 and 45–70% SiO_2, the sum of those two components constituting at least 75 mole percent, but not more than about 95 mole percent of the total composition, 0.025–2% europium, expressed as Eu_2O_3 but present in the glass as Eu^{+2} ions, and at least about 3% of compatible metal oxides which improve the melting and forming characteristics of the glass and/or modify the physical properties thereof.

4,102,806

METHOD OF PRODUCING MICROCAPSULES AND RESULTING PRODUCT

Sadao Kondo, Kawanishi, and Hidehiko Nakano, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,192
Claims priority, application Japan, Aug. 18, 1975, 50-100363
Int. Cl.[2] B01J *13/02*
U.S. Cl. 252—316 32 Claims

1. A method of producing a microencapsulated product, which comprises

(a) dissolving an oil-and-fat in an organic solvent by heating at a temperature within the range from 50° C to 100° C, said oil-and-fat being solid at room temperature, and melting at a temperature not lower than 30° C, said organic solvent being hardly or not capable of dissolving a core material to be encapsulated but capable of dissolving not less than 1 percent (weight/volume) of said oil-and-fat when hot and capable of coacervating not less than 50 percent of the dissolved oil-and-fat when cold,

(b) dispersing said core material in the resultant solution, said dispersion having the oil-and-fat at the ratio of 0.1–10:1 relative to the core material by weight basis and having the organic solvent at the ratio of at least 3:1 relative to the core material by volume/weight basis,

(c) cooling the dispersion to a temperature lower than 60° C with stirring to coacervate the oil-and-fat on the core material, and

(d) separating and drying the resultant encapsulated particulate product.

32. A microencapsulated product which is obtainable by the method of claim 1.

4,102,807

HYDROUS GEL AND PROCESS FOR ITS PREPARATION

Akio Iwama, and Isao Mune, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Apr. 23, 1976, Ser. No. 679,611
Claims priority, application Japan, Apr. 24, 1975, 50-50300
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—316 22 Claims

1. A hydrous gel consisting essentially of a heat-moldable w/o emulsion composed of about 15 to about 95% by weight of a continuous phase consisting of an A-B-A type teleblock copolymeric elastomer which consists of a hard polymer block A of vinyl compound and a soft polymer block B of a conjugated diene and an oil component and about 85 to about 5% by weight of a dispersed water phase resulting from the emulsification of water particles by an emulsifier having the property of forming a dispersed phase of innumerable emulsified water particles in the continuous phase consisting of the teleblock elastomer and the oil component and maintaining the form of the w/o emulsion in a stable fashion, said hydrous gel being capable of providing a gel product containing emulsified water particles stable at room temperature.

4,102,808

LATEX FROTHING AGENT

Daniel Charles Straka, Sewickley, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Division of Ser. No. 728,687, Oct. 1, 1976, Pat. No. 4,049,587.
This application Jun. 1, 1977, Ser. No. 802,229
Int. Cl.[2] B01F *17/42, 17/32*
U.S. Cl. 252—354 2 Claims

1. A latex frothing agent useful for entraining air in a froth of aqueous latex dispersion of an elastomer, said latex frothing agent consisting essentially of an aqueous solution containing about 70% water and about 25% magnesium di(lauryl sulfate), about 2.5% polyalkoxyglycerol having about eight alkoxy groups per hydroxyl group and about 2.5% of a quaternary dihydroimidazole derivative, there being a fatty acid carbon chain attached as the only carbon-carbon linkage for the carbon between the nitrogens of the dihydroimidazole ring, the quaternary nitrogen partaking of the nature of a quaternary sodium glycinate having at such quaternary nitrogen both an alkhydroxy group and said dihydroimidazole ring.

4,102,809

MALONIC ACID COMPOSITION FOR THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 390,284, Aug. 21, 1973, Pat. No. 3,973,438.
This application Mar. 23, 1976, Ser. No. 669,554
Int. Cl.[2] C09K *3/00;* C08K *5/09;* C08L *63/00*
U.S. Cl. 252—408 9 Claims

1. A composition curable at room temperature comprising malonic acid and a solution of an air-dryable epoxy a resinous carrier stable and solid at 80° C when cured.

4,102,810

STABILIZED HEMATOLOGICAL REAGENT SOLUTIONS

Douglas Armstrong, Coral Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 540,584, Jan. 13, 1975, Pat. No. 3,962,125. This application Mar. 26, 1976, Ser. No. 670,924
The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.
Int. Cl.[2] C09K *3/00;* G01N *33/16*
U.S. Cl. 252—408 R 6 Claims

1. An osmotically balanced reagent for calibrating instruments utilized in hematological studies utilizing electronic particle analysis study methods, including a composition for stabilization of the mean cell volume of blood cells in the reagent consisting essentially of a mixture of 2-phenoxyethanol and sodium fluoride.

4,102,811

CATALYST DEMETALLIZATION BY OXIDATION IN A DEFINED TEMPERATURE RANGE

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jun. 14, 1976, Ser. No. 695,687
Int. Cl.[2] C10G *11/18;* B01J *8/24, 29/38*
U.S. Cl. 252—411 R 16 Claims

1. A process for treating a metal contaminated catalyst which has been poisoned in a hydrocarbon conversion process by a feedstock containing metal poison to remove at least a portion of the metal contaminants and to produce a catalyst with improved catalytic activity which comprises

contacting at least a portion of said metal contaminated catalyst with at least one sulfur containing compound to provide a catalyst containing sulfur containing metal compounds;

contacting said catalyst containing sulfur containing metal compounds with an oxygen-containing gas at a temperature maintained within the range of from 550° F. to 725° F. for a time sufficient to promote subsequent metals removal by converting at least a portion of said catalyst metals to a dispersible form;

removing at least a portion of the metal poisons from the oxygen treated catalyst by contacting said oxygen treated catalyst with a reductive wash medium; and

recovering a catalyst of reduced metal poison content and improved catalyst activity.

4,102,812

PRODUCTION OF CARBON FROM COAL GRANULES PREPARED IN A FLUID ENERGY MILL

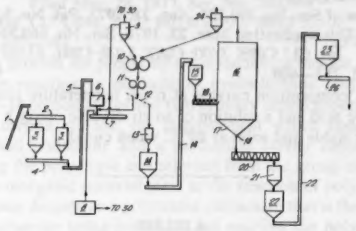
Michael Robinson, Healing; David Barry Mobbs, Grimsby, and Kirit Talati, Immingham, all of England, assignors to Laporte Industries, Limited, Luton, England

Filed Sep. 21, 1976, Ser. No. 725,278

Claims priority, application United Kingdom, Oct. 2, 1975, 40231/75

Int. Cl.[2] C01B *31/10, 31/14;* B01J *21/18*

U.S. Cl. 252—421 15 Claims



1. A process for the production of active carbon comprising the steps of

a. milling a medium to high caking coal in a superheated steam atmosphere in a fluid energy mill to produce a milled product in which less than 10% by weight of the particles have diameters below 1 microns and at least 90% by weight have diameters not below 1 micron and not above 10 microns and not more than 1% by weight of the particles have diameters above 38 microns

b. compacting the product from the milling step, in the absence of binders, while the temperature of the product is at least 50° C and not more than 250° C to produce agglomerates

c. reducing the agglomerates in size to produce granules

d. oxidising the granules to a non-swelling non-caking form

e. carbonising the oxidised granules

f. steam activating the carbonised granules

g. recovering the resulting active carbon.

4,102,813

CATALYST FOR PURIFYING EXHAUST GASES

Sadahiro Kimura; Kiyoshi Uchida, and Hiroyuki Akizuki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 16, 1975, Ser. No. 568,549

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Claims priority, application Japan, Apr. 22, 1974, 49-04529

Int. Cl.[2] B01J *31/02*

U.S. Cl. 252—430 10 Claims

1. A catalyst for purifying exhaust gases, which comprises a catalyst carrier composed at least mainly of alumina, which has an α-alumina layer near the surface of the carrier said α alumina, layer having a larger pore diameter than the interior portion of said carrier under said layer, said carrier being impregnated with an active catalytic component for purifying exhaust gases which extends more deeply into the carrier than said α-alumina layer.

4. The catalyst of claim 1, wherein the active catalytic component with which the carrier is impregnated comprises palladium.

4,102,814

OXYGEN SCAVENGER IN ELEMENTAL COMBUSTION ANALYSES

Grant M. Gustin, Oxford, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,563

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—408 1 Claim

1. A copper reagent useful in combustion analyses consisting of a granular mixture of copper and a porous, inert, diatomaceous earth of a fineness greater than 100 USP mesh in which the ratio of copper to said earth is 6:1 w/w.

4,102,815

ALPHA HALO SUBSTITUTED ASYMMETRICAL DIACYL PEROXIDES IN CO-INITIATOR SYSTEMS

Ronald L. Friedman, deceased, late of San Rafael, Calif. (by Patty R. Friedman, executor), and Roger N. Lewis, Martinez, Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

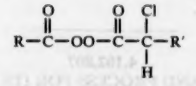
Filed Nov. 8, 1976, Ser. No. 739,416

Int. Cl.[2] B01J *31/02*

U.S. Cl. 252—426 16 Claims

1. An organic peroxide polymerization co-initiator composition consisting essentially of:

(a) an alpha halo substituted diacyl peroxide of the structure



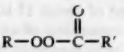
where

R = alkyl group of 1–11 carbon atoms and

R′ = alkyl group of 2–10 carbon atoms; and

(b) a coperoxide selected from

(1) t-alkyl peresters of t-hydroperoxides of the structure

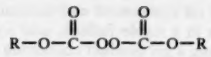


where

R = t-alkyl of 4–20 carbon atoms and

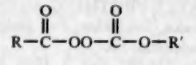
R′ = t-alkyl of 4–20 carbon atoms

(2) peroxydicarbonates of the structure



where each R = alkyl or cycloalkyl of 1–18 carbon atoms

(3) acyl peroxycarbonic esters of the structure

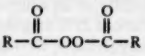


where

R = alkyl or aryl of 1–11 carbon atoms and

R′ = alkyl of 1–18 carbon atoms

(4) aliphatic diacyl peroxides of the structure



where each R = alkyl of 2–11 carbon atoms; and wherein the weight ratio of alpha halo substituted diacyl peroxide to coperoxide is about 3:1 to 1:3.

4,102,816

ADSORBENT FOR POLYNUCLEAR AROMATIC COMPOUNDS

David L. Stalling; James N. Huckins, and William Allen Smith, all of Columbia, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,500
Int. Cl.[2] B01J *31/02, 21/18;* C07C *319/14, 307/00*
U.S. Cl. 252—428 4 Claims

1. An adsorbent comprising powdered charcoal coated on a support material consisting essentially of polyurethane foam.

4,102,817

CATALYST COMPOSITION FOR THE PREPARATION OF BUTADIENE

Morford C. Throckmorton, and William M. Saltman, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,176, Jul. 18, 1973, Pat. No. 3,856,764, which is a continuation-in-part of Ser. No. 202,024, Nov. 24, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,629
Int. Cl.[2] C08F *4/70*
U.S. Cl. 252—429 B 1 Claim

1. A catalyst composition consisting essentially of (1) an organoaluminum compound of the formula

wherein R_1 is selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, alkoxy, hydrogen and fluorine, R_2 and R_3 being selected from the group consisting of alkyl, including cycloalkyl, aryl, alkaryl and arylalkyl, (2) organonickel compound selected from the class consisting of nickel salts of carboxylic acids, organic complex compounds of nickel, nickel tetracarbonyl and mixtures thereof and (3) at least one hydrogen fluoride complex (HFC) prepared by complexing hydrogen fluoride with a member of the class consisting of ketones of the formula

wherein R and R′ represent alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms and R and R′ may be the same or dissimilar, alcohols of the formula ROH where R represents alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms, nitriles represented by the formula RCN where R represents alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms, and water, in which the mole ratio of the organoaluminum compound to the organonickel compound ranges from about 0.3/1 to about 300/1, the mole ratio of the hydrogen fluoride complex to the organonickel compound ranges from about 2/1 to about 300/1, and the mole ratio of the hydrogen fluoride complex to the organoaluminum compound ranges from about 0.2/1 to about 15/1, said catalyst is preformed in the presence of a conjugated diolefin, said conjugated diolefin being present in a mole ratio of conjugated diolefin to organonickel compound from about 5/1 to about 500/1.

4,102,818

HYDROTREATING CATALYST AND PROCESS UTILIZING THE SAME

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 706,217, Jul. 19, 1976, Pat. No. 4,038,177. This application Feb. 4, 1977, Ser. No. 765,821
Int. Cl.[2] B01J *27/02, 23/16;* C01F *7/02*
U.S. Cl. 252—439 13 Claims

1. A catalyst comprising alumina and hydrogenation components composited with said alumina, said hydrogenation components being selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a Group VIB element of the Periodic Table of Elements and at least one elemental metal, metal oxide and metal sulfide of a Group VIII element of the Periodic Table of Elements, said alumina having been prepared by the steps which comprise reacting a solution of an aluminate selected from the group consisting of alkali metal aluminate and ammonium aluminate with an aqueous solution of an aliphatic dicarboxylic acid selected from the group consisting of C_2 to C_6 saturated aliphatic dicarboxylic acid and C_2 to C_6 unsaturated aliphatic dicarboxylic acids to precipitate a hydrous aluminum oxide, said dicarboxylic acid being present in an amount of at least one mole of said acid per 2 moles of said aluminate.

4,102,819

FINELY PARTICULATED COLLOIDAL PLATINUM, COMPOUND AND SOL FOR PRODUCING THE SAME, AND METHOD OF PREPARATION

Henry G. Petrow, Cambridge, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech, Inc., Burlington, Mass.

Division of Ser. No. 430,190, Dec. 28, 1973, abandoned, which is a continuation of Ser. No. 153,824, Jun. 16, 1971, abandoned. This application May 9, 1977, Ser. No. 794,802
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.[2] B01J *23/42*
U.S. Cl. 252—460 4 Claims

1. A process for preparing a conversion catalyst characterized by substantially improved conversion of hydrocarbons consisting essentially of the following steps:

a. preparing a solution from a platinum complex compound comprising the radical $Pt(SO_3)_4$ or $Pt(SO_3)_2$,
b. impregnating a base selected from the group consisting of alumina, silica and zirconia with said solution,
c. drying said solution, and decomposing and reducing said radical,
d. recovering the catalyst product.

4,102,820

SILVER CATALYST FOR ETHYLENE EPOXIDATION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,704
Int. Cl.[2] B01J *21/04, 23/66*
U.S. Cl. 252—463 22 Claims

1. A process for preparing a supported silver containing catalyst for the vapor phase epoxidation of ethylene with an oxygen containing epoxidizing agent comprising the steps of:

contacting a porous, inorganic, catalyst support material with an impregnating solution comprising a silver carboxylate amine complex; and,
heating the impregnated support material at temperatures from about 50° C to 300° C to evaporate volatiles, decompose said complex and activate sand catalyst,
wherein said silver carboxylate/amine complex comprises a silver carboxylate dissolved in a solubilizing amount of an amine-containing complexing agent selected from the group consisting of
(A) aliphatic polyamines containing at least three amino moieties wherein at least one is primary or secondary; and

(B) aliphatic amino ethers containing at least one ether linkage and at least one amino moiety which is primary or secondary.

4,102,821

METHOD FOR PREPARING AN ALUMINA AS A SUPPORT FOR A HYDROTREATING CATALYST

George N. Pessimisis, Berwyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 662,498, Mar. 1, 1976. This application May 31, 1977, Ser. No. 801,878

Int. Cl.[2] B01J *21/04*

U.S. Cl. 252—463 **3 Claims**

1. An improvement in a method for the preparation of an alumina useful as a support for a hydrotreating catalyst, said method generally comprising of:

A. Precipitating an alumina;

B. Reducing the moisture content of said alumina;

C. Washing and purifying said alumina;

D. Forming said alumina;

E. Drying said alumina; and then,

F. Calcining said alumina; the improvement consisting essentially of adding to the alumina prior to step D and after step C above an aqueous solution containing from 0.1 to 15.0% by weight based on the dry weight of the alumina of a water-soluble polycarboxylic acid having 2–22 carbon atoms whereby a catalyst support having substantially diminished pore volume in the range of 100–1200A is prepared.

4,102,822

HYDROCARBON HYDROCONVERSION CATALYST AND THE METHOD FOR ITS PREPARATION

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 26, 1976, Ser. No. 708,804

Int. Cl.[2] B01J *21/04, 23/84, 23/64, 27/04*

U.S. Cl. 252—465 **29 Claims**

1. A catalyst composition comprising a rigidly interconnected pack of irregularly shaped particles of which (1) less than 5 weight percent thereof have average diameters in the range 0.15 to 1.3 mm, (2) at least 10 weight percent thereof have average diameters in the range above 0.1 micron and (3) the remainder thereof have average diameters in the range below 0.15 mm, said pack having a pore volume of at least 0.065 cc per cc of the pack and having access channels among said particles throughout the pack, said channels comprising interconnected macropores having diameters as measured by mercury porosimetry in the range 0.1 to 15 microns, and said macropores contributing a fraction of said pore volume, which is in the range from about 3 to 45 percent of said pore volume; said particles comprising pulverable materials selected from the group consisting of at least one refractory oxide component and at least one hydrogenating component, said refractory oxide component being further selected from the group consisting of the oxides of the metals of Groups II, III and IV, said hydrogenating component being further selected from the group consisting of the metals, oxides and sulfides of the elements of Groups VIB and VIII; and said composition containing, in parts by weight, for each 100 parts of said refractory oxide component an amount of said hydrogenating component, calculated as metal, in the range from about 0.1 to 50 parts.

4,102,823

LOW AND NON-PHOSPHATE DETERGENT COMPOSITIONS

J. Neal Matheson, Burlington, Canada, and David L. Richardson, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 313,317, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 302,446, Oct. 31, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,991

Int. Cl.[2] C11D *1/83, 3/04, 3/10, 11/03*

U.S. Cl. 252—533 **14 Claims**

1. A granular spray-dried detergent composition consisting essentially of:

(A) from about 10% to 30% by weight of a surfactant system consisting essentially of

(i) an anionic surfactant selected from the group consisting of

(a) the sodium and potassium salts of sulfated fatty alcohols, said alcohols containing from about 8 to 18 carbon atoms;

(b) the sodium and potassium salts of alkyl benzene sulfonic acids in which the alkyl group contains from 9 to 20 carbon atoms; and,

(c) mixtures thereof; and

(ii) a nonionic surfactant produced by the reaction of one mole of a higher fatty alcohol containing from 10 to 15 carbon atoms with from about 3 to 10 moles of ethylene oxide, said nonionic surfactant having a hydrophili-clipophilic balance of from about 10 to 13.5;

the weight ratio of anionic surfactant to nonionic surfactant within said surfactant system varying between 2.8:1 and 5:1;

(B) from about 10% to 90% by weight of a mixture of salts comprising from about 40% to 50% by weight of said salt mixture of alkali metal carbonates; from about 40% to 50% by weight of said salt mixture of alkali metal silicates having M_2O/SiO_2 weight ratios of from about 1:2.0 to 1:2.4, and from about 5% to 20% by weight of said salt mixture of an electrolyte salt selected from the group consisting of sodium acetate, potassium acetate, alkali metal sulfosuccinate, and magnesium sulfate; and

(C) from about 3% to 6% by weight of water.

4,102,824

NON-AQUEOUS DETERGENT COMPOSITION

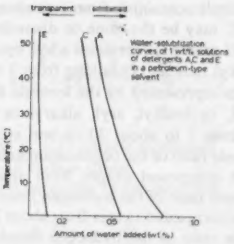
Hiroshi Mizutani, Yachiyo; Masaru Tamura, Sakura, and Katsumi Saegusa, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,182

Claims priority, application Japan, Jun. 25, 1976, 51-75346

Int. Cl.[2] C11D *1/22, 3/30, 7/50*

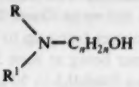
U.S. Cl. 252—545 **8 Claims**



1. A dry cleaning detergent composition consisting essentially of

(A) from 5 to 50 percent by weight of a salt, or a mixture of salts, of a linear long-chain alkylbenzenesulfonic acid

having 10 to 16 carbon atoms in the alkyl group, with a dialkylalkanolamine having the formula (I):



(I)

wherein R and R^1, which can be the same or different, are linear or branched alkyls having 2 to 4 carbon atoms and *n* is 2 or 3;

(B) from 30 to 60 percent by weight of one or a mixture of surface active agents soluble in the organic solvent C and effective for dry cleaning selected from the group consisting of polyoxyethylene nonylphenyl ethers having 2 to 20 moles of added ethylene oxide units, polyoxyethylene alkyl ethers having 2 to 20 moles of added ethylene oxide units and C_{10} to C_{20} alkyl group, fatty acid sorbitan esters, fatty acid alkylolamides derived from C_{10} to C_{20} fatty acids and an alkylolamine selected from the group consisting of monoethanolamine, diethanolamine, monoisopropanolamine and diisopropanolamine, dialkylsulfosuccinic acid salts in which the alkyl group has 6 to 10 carbon atoms, alkylbenzenesulfonic acid salts and petroleum sulfonates wherein the counter ion of said salts is sodium, potassium or lower alkanolamine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine and triisopropanolamine, the sum of A and B being from about 35 to about 80 percent by weight, based on the total weight of the composition, and

(C) the balance is essentially an organic solvent effective for dry cleaning selected from the group consisting of benzine, mineral spirit, perchloroethylene, trichloroethane and carbon tetrachloride.

4,102,825
LIQUID LIGHT-DUTY DETERGENT COMPOSITION

Moriyasu Murata, Chiba, and Kimie Ide, Tokyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

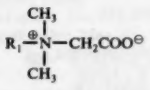
Filed Sep. 9, 1977, Ser. No. 831,954
Claims priority, application Japan, Oct. 1, 1976, 51-118332
Int. Cl.[2] C11D *1/38, 3/26, 7/32*
U.S. Cl. 252—547 **5 Claims**

1. A liquid light-duty detergent composition consisting essentially of

(1) from one to 5% by weight of a mixture of

(a) a fatty acid diethanolamide derived from a saturated fatty acid having 10 to 14 carbon atoms and

(b) an amphoteric surface active agent having the formula (I):

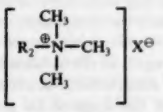


(I)

wherein R_1 is alkyl having 10 to 14 carbon atoms, wherein the weight ratio of the fatty acid diethanolamide (a) to the amphoteric surface active agent (b) is in the range of from 90/10 to 10/90,

(2) from 0.5 to 5% by weight of a mixture of

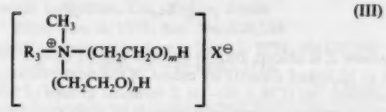
(c) a cationic surface active agent having the formula (II):



(II)

wherein R_2 is alkyl or alkenyl having 14 to 20 carbon atoms, and X is cl or Br, and

(d) a cationic surface active agent having the formula (III):



(III)

wherein R_3 is alkyl or alkenyl having 14 to 20 carbon atoms, *m* and *n* each is an integer of at least one, with the proviso that the sum of *m* and *n* is in the range of from 2 to 8, and *x* is Cl or Br, wherein the weight ratio of the cationic surface active agent (c) to the cationic surface active agent (d) is in the range of from 90/10 to 10/90,

(3) from 15 to 30% by weight of an alkyl ethoxylate formed by adding 3 to 12 moles of ethylene oxide to one mole of an alcohol having 12 to 15 carbon atoms, and

(4) the balance is essentially water.

4,102,826
LIQUID DETERGENT

Jean Renaud, Bougival, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 418,288, Nov. 23, 1973, abandoned. This application Dec. 18, 1976, Ser. No. 750,097
Claims priority, application France, Dec. 6, 1972, 72 43324
Int. Cl.[2] C11D *3/26*
U.S. Cl. 252—548 **9 Claims**

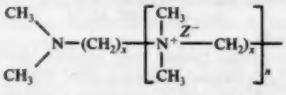
1. A liquid detergent composition consisting essentially of 10% to 40% by weight of a water-soluble paraffin monosulfonate salt wherein the paraffin is a mixture of 14 carbon atoms and and 15 carbon atoms in a weight ratio of C_{14} monosulfonate to C_{15} monosulfonate of from 1:3 to 3:1 and the salt forming ion is selected from the group consisting of sodium, potassium, ammonium and C_2–C_4 alkanolammonium, 2 to 30% by weight of a corresponding water-soluble salt of a disulfonate of said paraffin mixture, 0 to 15% by weight of said paraffin mixture and 0 to 20% by weight of a corresponding water-soluble salt of an inorganic sulfate, the weight proportions of said disulfonate salt, said paraffin and said sulfate salt being based upon the weight of said monosulfonate salt, solubilized in an aqueous medium, said paraffin monosulfonate being the principal detergent component and said composition containing no significant quantities of paraffin monosulfonate of other carbon contents.

4,102,827
NOVEL POLYELECTROLYTES

Alan Rembaum, and Shiao-Ping Siao Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

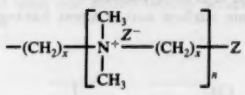
Division of Ser. No. 427,917, Dec. 26, 1973, Pat. No. 4,036,808, which is a division of Ser. No. 280,649, Aug. 14, 1972, Pat. No. 3,898,188. This application Jan. 21, 1976, Ser. No. 650,910
Int. Cl.[2] C08G *73/00*
U.S. Cl. 260—823 **8 Claims**

1. A polyelectrolyte having an intrinsic viscosity molecular weight of at least 30,000 as determined by light scattering in 0.4M K Br consisting essentially of the adduct of linear polymeric segments of the formula:

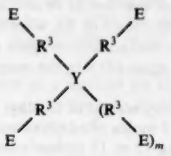


or

-continued



where Z is chloro, bromo or iodo, n is an integer and x is 3 or 7 to 10 linked directly by means of the quaternization reaction between the $(CH_3)_2N$— or Z terminal groups of the segments to the tertiary amine or Z groups of a polyfunctional central monomer or polymeric substrate, said central monomer being selected from compounds of the formula:



where Y is a polyvalent low molecular weight organic group having a valence of $3+m$, m is an integer from 0-3, R^3 is selected from alkylene, phenylene or alkyl ester and E is Z or $(R^4)_3N$— where R^4 is alkyl, aryl or aralkyl and said polymeric substrates are selected from the group consisting of polyvinylpyridine, polyethyleneimine, polyvinylbenzylchloride, poly-(dialkylaminoalkyl acrylate), poly-(dialkylamino alkyl acrylamide, polyepichlorohydrin and polydialkylaminoalkylethylene oxide.

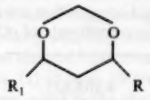
4,102,828

POLYURETHANES DERIVED FROM NOVEL NOVOLAK POLYOLS

Howard P. Klein, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Apr. 28, 1976, Ser. No. 681,005
Int. Cl.[2] C08G *18/28*
U.S. Cl. 521—174 **18 Claims**

10. A polyurethane comprising the reaction product of an organic polyisocyanate and a polyol comprising an alkoxylated novolak, which novolak is the condensation product of a monohydric phenol having at least two reactive hydrogens, and a 1,3-dioxane having the formula:



where R is selected from the group consisting of phenyl, substituted phenyl and gem dialkyl, and R_1 is selected from the group consisting of hydrogen, alkyl, phenyl, and substituted phenyl.

4,102,829

FOAMED THERMOPLASTIC RESIN COMPRISING A MIXTURE OF IONOMER AND POLYOLEFIN

Seizaburo Watanabe; Eiji Hattori, and Kanau Mori, all of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 692,875
Claims priority, application Japan, Jun. 21, 1975, 50/75809
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—81 **15 Claims**

1. A thermoplastic foamed resin product characterized by low density, high thermal resistance, good adhesion properties and uniform cell size which comprises a mixture containing from 35% to 95% ionomer characterized by the presence of a monomer unit based on an unsaturated carboxylic acid and 5% to 65% polyolefin polymer or copolymer, based on the total weight of resin; the ethylene monomer unit and unsaturated carboxylic acid ester monomer unit values of the ionomer being from 50 to 97 mol% and up to 30 mol%; respectively, the neutrality value of the ionomer being up to 50%, the saponification value of the ionomer being at least 50%, and the melt index of the ionomer being from 0.1 to 50 g/10 min.; the melt index of the polyolefin being from 0.1 to 30 g/10 min.

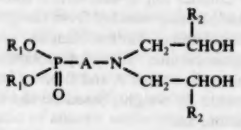
4,102,830

DIOL-PHOSPHONATES AS FLAME-RETARDANTS IN POLYURETHANE FOAM

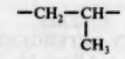
Georges L. Sturtz, Brest; Serge L. Lecolier, Janville sur Juine; Jean-Claude Clement, Brest, and Jean Marie Biehler, Brunstatt, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 570,413, Apr. 22, 1975, Pat. No. 4,052,487.
This application May 31, 1977, Ser. No. 801,837
Claims priority, application France, May 13, 1974, 74 16477
Int. Cl.[2] C08G *18/32*
U.S. Cl. 521—165 **7 Claims**

1. A polyurethane foam obtained by reaction of a compound of the formula:



in which R_1 is an alkyl group with 1 to 4 carbon atoms, R_2 is hydrogen, methyl, or ethyl, and A is —CH_2—CH_2—CH_2—, or



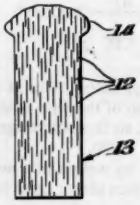
as at least part of the polyol component with a diisocyanate; said reaction is performed in the presence of a pore-forming agent.

4,102,831

IMPARTING ANISOTROPY TO FOAMS BY ORIENTING ADDED FIBERS WHEREBY SAID FIBERS BECOME PARALLELY ALIGNED

Alan A. Osgood, 32 Woodhill Dr., Newark, Del. 19711

Filed Oct. 12, 1976, Ser. No. 731,742
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—99 **10 Claims**



1. A process for imparting anisotropy to foams which comprises mixing in liquid form the components of the foam which are to react during the foaming step to produce said foam by the action of a foaming agent to effect foam expansion, mixing therewith an amount of about 0.008% to about 10% by weight based on the weight of the foam to be produced of fibers having a length no greater than about 0.5 inch, and a length to

diameter ratio not less than 4/1, and then effecting foaming, orienting said fibers by the action of the foaming agent whereby said fibers become substantially parallelly aligned to the direction of said foam expansion.

4,102,832

METHOD OF HARDENING AND FOAMING LIQUID RESOLS USING A MIXTURE OF DILUENT AND AROMATIC SULFONIC ACID

Franz Weissenfels, Siegburg am Grafenkreuz, and Hans Jünger, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 616,539, Sep. 25, 1975, which is a continuation of Ser. No. 386,675, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 201,244, Nov. 22, 1971, abandoned, which is a division of Ser. No. 830,865, Jun. 5, 1969, abandoned. This application Oct. 22, 1976, Ser. No. 734,847

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1968, 1769535

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—103 **2 Claims**

1. A process for hardening a resol which consists essentially of the reaction product of a phenol with an aldehyde in admixture with a foaming agent, which comprises premixing a solid aromatic sulfonic acid selected from the group consisting of p-toluenesulfonic acid, a non-dyeing solid phenolsulfonic acid, o-, m- or p-cresolsulfonic acid, chlorobenzene-3,5-disolfonic acid, bromobenzene-4-sulfonic acid, aniline-2,5-disulfonic acid, naphthalenesulfonic acid and naphthylaminesulfonic acid with a diluent having a particle size between 10 and 50 millimicrons, which diluent is selected from the group consisting of silica, activated charcoal, bentonite, boric acid and boron trioxide to thereby form a free-flowing hardener mixture consisting essentially of said sulfonic acid and said diluent, said acid being present in an amount of 5–50% by weight based upon the combined weight of the solid sulfonic acid and diluent and, thereafter, introducing said hardener mixture in an amount of 2–20% by weight based upon the weight of resol into a liquid-form resol containing foaming agent, said resol prepared by condensing 1 mol of a phenol with 1–3 mols of an aldehyde in an alkaline medium followed by water removal until the resol has a solid content between 60 and 80% and maintaining the resultant admixture for a time sufficient to harden such liquid-form resol.

4,102,833

COLD IMPACT RESISTANT URETHANE FOAM

Wayne C. Salisbury, Middleton, N.H., assignor to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 642,559, Dec. 19, 1975, Pat. No. 4,048,105. This application Mar. 16, 1977, Ser. No. 778,001

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—159 **8 Claims**

1. A urethane foam quasi-prepolymer having a free isocyanate content in the range of 27 to 31% and consisting essentially of the reaction product of (parts by weight):

Pure MDI	80 to 90
LMW Polyol	3 to 20

wherein said pure MDI is 99%+ methylene bis (4-phenyl isocyanate) and said LMW Polyol is selected from the group consisting of a polyether polyol and polyether polyol blends and has a molecular weight in the range of 240 to 1500 and a functionality in the range of 2.6 to 3.3 on the average for all polyol present, said quasi-prepolymer being made by blending together said pure MDI and LMW polyol and allowing the blend to react at an elevated temperature.

4,102,834

HYDROCARBON RESINS AND PROCESS FOR PREPARING SAME

Teijiro Morimoto, Iwakuni; Isao Hashimoto, Waki, and Yoshiyuki Iwase, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,824

Claims priority, application Japan, Nov. 5, 1974, 49-126543

Int. Cl.[2] C08F *240/00*; C09J *3/14*

U.S. Cl. 260—4 AR **25 Claims**

1. A process for preparing a hydrocarbon resin which comprises copolymerizing (A) a hydrocarbon fraction boiling within the range of 135° to 280° C which is obtained by cracking, reforming and/or refining petroleum and contains, based on the weight of the fraction, 20 to 80% of polymerizable unsaturated hydrocarbons comprising, based on the weight thereof, 60 to 90% of cationically polymerizable aromatic hydrocarbons, 5 to 15% of olefins and 0 to 10% of diolefins, with (B) dicyclopentadiene in the presence of a Friedel-Crafts catalyst in a proportion such that the resulting hydrocarbon resin contains, based on the total weight thereof, 20 to 80% of a unit derived from the dicyclopentadiene (B).

4,102,835

HIGH STRENGTH ADHESIVES, FILMS AND COATINGS

Charles R. Freeman, Lincoln Township, Washington County, and Charlotte I. Sauer, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 172,590, Aug. 17, 1971, abandoned, Continuation-in-part of Ser. No. 856,145, Sep. 8, 1969, abandoned, which is a continuation of Ser. No. 592,268, Nov. 7, 1966, abandoned. This application Jan. 29, 1976, Ser. No. 653,385

Int. Cl.[2] C08L *7/00, 53/02*

U.S. Cl. 260—5 **6 Claims**

1. A thin, self-supporting, tacky, clean-breaking, pressure-sensitive adhesive transfer film including an internal reinforcing polymer additive, said film having a thickness of up to about 2 mils and comprising the following admixed components:

(1) a crosslinked, tackifiable rubbery polymer having properties suitable for use in a rubber-resin adhesive, said tackifiable rubbery polymer being a homopolymer or random sequence polymer,

(2) a tackifier resin component capable of imparting aggressive tack to said tackifiable rubbery polymer, and

(3) 5 – 30 parts by weight, per 100 parts of the total weight of components (1)and (2), but in no event more than about 80 parts by weight per 100 parts by weight of said component (1), alone, of a block copolymer reinforcing component, said block copolymer reinforcing component being compatible with said components (1) and (2) and comprising at least three polymer blocks of the type

- A - B - A -

wherein each A is a plastic polymer block, which, as a homopolymer, has a glass transition temperature above 20° C., the average molecular weight of each block A being between about 5,000 and about 125,000; B is a polymer block of a conjugated diene, the average molecular weight of each block B being between about 15,000 and about 250,000; the total blocks A being less than about 80% by weight of the block copolymer.

4,102,836
WATER-DISPERSIBLE OLEORESINOUS PAINT BINDERS

Norman Walter Johnson, Orpington, England, assignor to Contes Brothers & Co., Ltd., London, England

Filed Apr. 7, 1977, Ser. No. 785,566

Claims priority, application United Kingdom, Apr. 7, 1976, 14125/76

Int. Cl.[2] C09D *3/64, 3/72*

U.S. Cl. 260—22 TN **6 Claims**

1. A process for the preparation of a water-dispersible oleoresinous film-forming material which comprises reacting a first hydroxyl group-containing alkyd resin with an organic diisocyanate in an amount such that the ratio of isocyanate groups in the diisocyanate to hydroxyl groups in the alkyd resin is about 2:1, to produce an adduct containing free isocyanate groups and subsequently reacting the adduct with a second hydroxyl group-containing alkyd resin to form a diadduct containing the first alkyd resin and the second alkyd resin, in which one of said first and second alkyd resins is a relatively hydrophilic alkyd resin and the other is a relatively hydrophobic alkyd resin and in which the relatively hydrophilic alkyd resin forms a minor proportion by weight of the total of relatively hydrophobic and relatively hydrophilic alkyd resin .

4,102,837
UNSATURATED POLYESTER RESIN COMPOSITION COMPRISING POLYPROPYLENE ADIPATE

David Hamilton Thomas, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, England

Filed May 23, 1977, Ser. No. 799,160

Claims priority, application United Kingdom, Jun. 3, 1976, 22952/76; Sep. 14, 1976, 38003/76

Int. Cl.[2] C08G *63/46, 63/52;* **C08L** *91/06*

U.S. Cl. 260—22 CB **8 Claims**

1. An unsaturated polyester resin composition which comprises an ethylenically unsaturated polyester, an ethylenically unsaturated monomer copolymerisable therewith and polypropylene adipate, the ethylenically unsaturated polyester being made from a polyhydric alcohol containing up to 20 carbon atoms, terephthalic acid, and an ethylenically unsaturated polybasic acid containing up to 20 carbon atoms, the molar ratio of terephthalic acid to said polybasic acid being in the range 1:10 to 3:1.

4,102,838
COMPOSITION AND METHOD FOR SELECTIVE BORONIZING

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 23, 1977, Ser. No. 799,799

Int. Cl.[2] C09D *3/64;* **C23C** *11/10;* **C21D** *1/48*

U.S. Cl. 260—22 CB **17 Claims**

1. A paint adapted for resisting boronizing a predetermined surface area on which it is painted and forming a part of a larger surface area at least a portion of which is to boronized, comprising:

a. a concentration within the range of 10–50 percent by weight of finely divided titanium dioxide;

b. a concentration within the range of 20–70 percent by weight of finely divided carbonaceous material;

c. a concentration within the range of 5–20 percent by weight of organic resin that will burn away at a temperature greater than 1400° F; and

d. sufficient solvent to dissolve said resin and effect a predetermined viscosity; said viscosity being low enough to allow painting onto the predetermined surface area and being high enough to form a coating that will form a boronizing resist at said temperature greater than 1400° F; such that when said paint is applied to the predetermined surface area that is not to be boronized and that forms a part of the larger surface, at least a portion of which is to be boronized, said paint forms at said temperature a readily removable boronizing resist that protects the predetermined surface area against said boronizing and facilitates removal of said boronizing resist.

11. A method of selectively boronizing the surfaces of a ferrous metal that comprises applying to such area as is not to be boronized a coating consisting essentially of finely divided titanium dioxide, finely divided carbonaceous material and an anhydrous binding agent that will burn away at a temperature greater than 1400° F; said titanium dioxide, said carbonaceous material and said anhydrous binding agent being in effective amounts to form a boronizing resist having a boronizing resistance during boronizing and forming a readily removable boronizing resist following heating to said temperature in excess of 1400° F; then heating said area and said coating to at least said temperature above 1400° F and boronizing said ferrous metal at a temperature at least as great as said temperature at which said coating forms said boronizing resist and subsequently removing said readily removable boronizing resist.

4,102,839
STABILIZATION OF VINYL CHLORIDE POLYMERS

Michel Crochemore, Oullin, and Michel Gay, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 645,937, Dec. 31, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 754,232

Claims priority, application France, May 10, 1976, 76 14863; May 20, 1976, 76 15869; May 10, 1975, 75 00765; Sep. 22, 1975, 75 29466

Int. Cl.[2] C08K *5/07*

U.S. Cl. 260—23 XA **15 Claims**

1. In a composition of matter consisting essentially of a vinyl chloride polymer and [1] a divalent metal salt of a member selected from the group consisting of a lower aliphatic carboxylic acid, a fatty carboxylic acid and an aromatic carboxylic acid, the improvement comprising including [2] a dicarbonyl compound selected from the group consisting of β-diketones and β-keto-aldehydes having the structural formula:

$$R_1 - CO-CHR_2-CO-R_3$$

in which each of R_1 and R_3, which may be the same or different, represents a linear or branched alkyl or alkenyl radical having from 1 to 36 carbon atoms, an aralkyl radical having from 7 to 36 carbon atoms or an aryl or cycloaliphatic radical having less than 14 carbon atoms, said cycloaliphatic radical optionally containing one or more carbon-carbon double bonds, the aliphatic chains of said radicals optionally containing one

$$-\overset{\overset{O}{\|}}{C}-O-$$

radical, wherein one of R_1 or R_3 can represent a hydrogen atom; R_2 represents a hydrogen atom, a radical of the formula

$$-CO-R_4 \text{ or } -CO-O-R_4,$$

wherein R_4 represents an alkyl radical having 1 to 30 carbon atoms or an aryl radical if R_1 and R_3 are not aromatic, or a radical of the formula:

$$-CHR_4-CH\begin{cases}CO-R_1\\CO-R_3\end{cases}$$

wherein R_1, R_3 and R_4 are as defined above; or R_1 and R_2, together represent a divalent radical selected from the group consisting of an alkylene radical having from 1 to 12 carbon atoms and a cycloalkylene radical having less than 14 carbon atoms, said radicals being unsubstituted or substituted by an aliphatic radical having from 1 to 18 carbon atoms; wherein in R_1, R_2 and R_3 the carbon atoms adjacent to the indicated car-

bonyl groups are not doubly bonded to carbon atoms and no more than one of said carbon atoms is contained in an aromatic ring; and, wherein said dicarbonyl compound [2] and said divalent metal salt [1] are present in heat stabilizing amounts, with the proviso that said dicarbonyl compound is other than diaroylmethane.

4,102,840

PROCESS FOR THE MANUFACTURE OF UREA-HCHO-ISOBUTYRALDEHYDE CONDESNATION PRODUCTS AND COMPOSITIONS THEREOF

Günter Pusch, Leitershofen, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,912

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639754

Int. Cl.[2] C08G *12/42*; C08L *61/24*

U.S. Cl. 260—29.4 R 11 Claims

1. A process for the manufacture of a curable, textile-finishing condensation product, comprising the sequential steps of

(a) reacting 2 to 3 moles of urea with 0.9 to 1.1 moles of formaldehyde and 1 mole of isobutyraldehyde, at 50° C to 90° C, in the presence of 0.2 to 1.0 equivalent of strong acid and 4 to 18 moles of water, to give a condensate,

(b) adjusting the ph to a value in the range of 7 to 9.5 and removing at least part of the water,

(c) treating the condensate with 3 to 4 moles of formaldehyde to methylolate the condensate and

(d) etherifying the methylolated condensate with an alcohol of 1 to 3 carbon atoms.

4,102,841

HEAT SENSITIVE LATICES

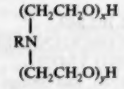
George John Antlfinger, Avon Lake, and Peter Dresel Seletzky, Berea, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 28, 1975, Ser. No. 635,575

Int. Cl.[2] C08L *9/10*

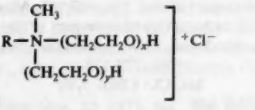
U.S. Cl. 260—29.6 N 7 Claims

1. A heat sensitive polymeric synthetic anionic latex consisting essentially of polymerized vinylidene monomers having at least one terminal $CH_2C<$ group, said polymers having a Tg° of about −80° C. to 150° C. containing a heat sensitizing amount of an ethoxylated amine selected from the group consisting of compounds having the formula



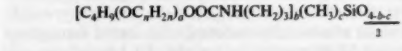
(1)

and



(2)

wherein R is an alkyl group containing 10 to 22 carbon atoms and the total of x and y is greater than 5 to about 50 and a heat sensitizing amount of a silicone polyether of the formula



wherein n, a, b and c are integers.

4,102,842

WATER-INSOLUBLE, HYDROPHILIC GELS AND A METHOD FOR THE PREPARATION OF THE SAME

Masanori Fujimoto, Ibaraki; Kozo Tsuji, and Tsuneyuki Nagase, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 22, 1976, Ser. No. 707,768

Claims priority, application Japan, Jul. 24, 1975, 50-90850; Mar. 4, 1976, 51-23761

Int. Cl.[2] C08L *29/02*

U.S. Cl. 260—29.6 PT 34 Claims

1. A method for the preparation of a water-insoluble hydrophilic gel comprising drying the saponified product of a copolymer of (1) a vinyl ester and (2) an ethylenically unsaturated carboxylic acid or derivative thereof, which is in a hydrated state, said saponified copolymer having at least one hydroxyl group and at least one carboxylato group, the degree of saponification of said vinyl ester (1) being at least 50 mole %, said ethylenically unsaturated carboxylic acid or derivative thereof (2) being present in an amount of 5 to 95 mole % of the copolymer and the saponification degree of (2) being at least 30 mole %, said hydrated state product having a water content of more than 100% by weight and said drying being to a water content of at most 50% by weight.

4,102,843

DISPERSING PAINT PIGMENTS

Peter Reeves Sperry, Doylestown; Richard J. Wiersema, North Wales, and Kayson Nyi, Sellersville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 7, 1977, Ser. No. 757,718

Int. Cl.[2] C08L *31/00*

U.S. Cl. 260—29.6 RW 29 Claims

1. An improved aqueous emulsion paint comprising a mixture of a film-forming latex polymer and a pigment dispersion, containing as dispersant, from about 0.01 to about 5%, based on pigment weight, of a water-soluble alkali metal, ammonium, or amine salt of a copolymer having a number average molecular weight in the range of about 500 to about 15,000 consisting essentially of polymerized units of (A) 45 to 90 weight percent of hydroxyalkyl ester of acrylic acid or methacrylic acid, wherein the alkyl group of the ester moiety has from two to six carbon atoms; and (B) 10 to 55 weight percent of acrylic acid, methacrylic acid, itaconic acid, or the half ester or half amide of itaconic acid.

4,102,844

DIPPED ARTICLES OF RUBBER

Ernst Schwinum, Leichlingen; Heinz Hornig, Cologne, and Martin Matner, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 506,986, Sep. 18, 1974, abandoned. This application May 20, 1976, Ser. No. 688,236

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1973, 2347755

Int. Cl.[2] B28B *1/38*

U.S. Cl. 260—29.7 T 5 Claims

1. A dipped article produced by the process which comprises dipping a mould in a coagulant and then in a rubber latex to thereby form a film of precipitated rubber on the surface of the coagulant coated mould and subsequently vulcanizing said precipitated rubber to form a dipped article, said rubber latex having an average rubber particle diameter of up to 200 nm, a solids content of 35 to 60% by weight, and a Defo value of less than 2,000 and having been prepared by polymerizing a monomer mixture consisting of

(a) 85 to 50 parts by weight of at least one member selected from the group consisting of butadiene and isoprene,

(b) 10 to 40 parts by weight of acrylonitrile or methacrylonitrile,

(c) 0 to 40 parts by weight of styrene,

(d) 0 to 10 parts by weight of at least one member selected

from the group consisting of acrylamide, methacrylamide and their methylol derivatives and

(e) 0.1 to 10 parts by weight of an α,β-unsaturated carboxylic acid, in aqueous emulsion in the presence of

(i) 0.5 to 6.0% by weight, based on the monomer mixture weight, of an alkarylsulphonate and

(ii) 0 to 5% by weight, based on the monomer mixture weight, of at least one surface active substance, at a pH below 7 and then adding on completion of polymerization of said monomer mixture, alkali metal hydroxide to adjust the pH to above 8.

4,102,845

SPREAD-COATING COMPOSITIONS FOR PAPER COMPRISING AN AQUEOUS DISPERSION OF STYRENE/BUTADIENE POLYMER AND POLYETHYLENE OXIDE

Georg Schröder, and Edgar Brehmer, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 610,768, Sep. 5, 1975, abandoned. This application May 2, 1977, Ser. No. 792,624

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1974, 2442704

Int. Cl.² C08L *9/08*

U.S. Cl. 260—29.7 NR **6 Claims**

1. In a spread-coating composition adapted for coating paper to improve the surface characteristics thereof, comprising about 94% to about 79% by weight of pigment or filler, and binder, said binder consisting of an aqueous dispersion of a styrene/butadiene-polymer, the improvement wherein the coating composition contains from about 5% to about 20% by weight, calculated on the total polymeric solids of the coating composition, of polyethylene oxides of a molecular weight of from about 6,000 to about 50,000.

4,102,846

STABLE DISPERSIONS OF POLYMER PARTICLES CONTAINING SUB-PARTICLES OF A SOLID MODIFYING AGENT AND PROCESS FOR MAKING SAME

John Bentley, and Morice William Thompson, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, England

Filed Feb. 9, 1977, Ser. No. 767,148

Claims priority, application United Kingdom, Feb. 19, 1976, 6613/76

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.2 N **22 Claims**

1. A process for the manufacture of a stable dispersion in an inert organic liquid medium of particles consisting of (a) a polymer which is insoluble in that medium, the polymer being obtained by the polymerisation of one or more reactive monomers at least one of which (hereinafter referred to as an insoluble solid monomer) has a melting point above the temperature at which the polymerisation reaction takes place and is insoluble in the liquid medium at that temperature, and from 0.1% to 90% by weight, based on the polymer, of (b) sub-particles within the polymer of a modifying agent for the polymer which is solid at the polymerization temperature, the process comprising the steps of (1) dispersing the solid monomer or each solid monomer and the modifying agent together in the inert organic liquid medium in the presence of 0.1% to 20%, based on the total volume of the dispersed phase, of a dispersing agent for the monomer or monomers so as to produce a stable dispersion of particles of the monomer or monomers and of the modifying agent having a mean diameter not greater than 50μ, the dispensing agent being soluble in the inert organic liquid and incorporating (i) a polymeric component which is solvatable by the liquid and (ii) a grouping which is capable of becoming associated with the surface of the particles of solid monomer or monomers and (2) heating the dispersion of solid monomer or monomers and modifier at the polymerisation temperature so as to bring about the polymerisation reaction, in the presence of a polymer-stabilising agent which is soluble in the inert organic liquid and incorporates (a) a polymeric component which is solvatable by the liquid and (b) a grouping which is capable of effecting association with the surface of the particles of the resulting polymer as the polymer is formed.

4,102,847

BAKING FINISHES OF LOW SOLVENT CONTENT

Heinrich Hartmann, Limburgerhof, and Hans Sander, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1976, Ser. No. 713,785

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539104

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.4 R **26 Claims**

1. A baking finish which comprises a reaction mixture of

(A) from 40 to 85% by weight of hydroxyl-containing polymers,

(B) from 10 to 55% by weight of amine/formaldehyde resins, and

(C) from 5 to 35% by weight of at least one aliphatic or cycloaliphatic polyisocyanate selected from the group consisting of tris-(isocyanatohexyl)-biuret, tris-(isocyanatohexyl)-isocyanurate, bis-(isocyanathohexyl)-uretdione and the biuret groups-containing reaction product of hexamethylenediisocyanate with 3,3'-dimethyl-4,4'-diaminodicyclohexylmethane, the sum of the above percentages being 100, and the viscosity of the baking finish of low solvent content being from 20 to 300 DIN seconds, measured in a DIN cup No. 4.

4,102,848

INCORPORATION OF FOOD GRADE DYESTUFFS INTO RESINOUS COMPOSITIONS AND ARTICLES PREPARED THEREFROM

Louis Koch, Yonkers, N.Y.; Michael Dunn, New Milford, and Charles Lumpkin, Ridgewood, both of N.J., assignors to H. Kohnstamm & Company Inc., New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,486

Int. Cl.² C08J *3/20*; C08K *5/00*

U.S. Cl. 260—31.6 **11 Claims**

1. A colored, non-toxic, resinous molding composition which comprises a major amount of a liquid containing thermoplastic or thermosetting resin solids and a minor amount of a color additive complex comprising an edible water soluble resin liquid insoluble food grade dye, a polyhydric alcohol and a polyglycerol higher fatty acid ester.

4,102,849

OIL-EXTENDED HYDROGENATED DIBLOCK COPOLYMER

Thomas Chester Bouton, Akron, and Shingo Futamura, Seville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 668,161, Mar. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 542,340, Jan. 20, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,123

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **11 Claims**

1. An oil-extended diblock copolymer composition comprising 10–200 parts by weight of oil and 100 parts by weight of a hydrogenated diene-styrene diblock copolymer consisting essentially of 20–70 percent by weight of a block of hydrogenated polybutadiene and 30–80 percent by weight of a block of hydrogenated random copolymer of 20–50 percent by weight of a vinyl arene substantially uniformly distributed throughout said block and 50–80 percent by weight of 1,3-butadiene, said diblock copolymer having an average molecular weight of

15,000–1,000,000 determined by viscosity measurement, the amount of residual aliphatic unsaturation in said hydrogenated diblock copolymer being less than 20% of the original aliphatic unsaturation, and the 1,2-microstructure content of the butadiene in the copolymer is 5–30 percent.

4,102,850

HIGH IMPACT POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING MINERAL OIL

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,250
Int. Cl.[2] C08L *71/04, 23/16*
U.S. Cl. 260—33.6 AQ **33 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about two microns, wherein the improvement comprises the modified alkenyl aromatic resin containing a small, effective, impact resistance-enhancing amount of mineral oil.

4,102,851

ALUMINA-THICKENED CYCLOALIPHATIC EPOXY MATERIALS FOR USE IN ATMOSPHERES OF ARCED SULFUR HEXAFLUORIDE AND ARTICLES THEREOF

Russell M. Luck, Monroeville, and Gordon C. Gainer, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1977, Ser. No. 780,146
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—37 EP **18 Claims**

1. Thixotropic compositions of matter consisting essentially of:

(a) 100 parts by weight of a monomeric cycloaliphatic epoxy containing at least one cycloaliphatic ring,

(b) about 30 to about 150 parts by weight of a flexibilizing agent selected from the group consisting of a polyazelaic polyanhydride, hexahydrophthalic anhydride and mixtures thereof,

(c) about 120 to about 250 parts by weight of a material selected from the group consisting of aluminum trihydrate, naturally occurring magnesite and mixtures thereof acting as the filler, and

(d) about 10 parts to about 75 parts by weight of Al_2O_3 having an average particle size of between about 0.0005 micron to about 0.10 micron, acting as the thixotroping agent, said thixotropic composition having chemical resistance to arced SF_6 upon cure.

4,102,852

SELF-EXTINGUISHING ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

Pearline DeLaTorre, Elnora, and Melvin D. Beers, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,379
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **28 Claims**

1. A self-extinguishing room temperature vulcanizable silicone rubber composition comprising (a) 100 parts of a silanol end-stopped diorganopolysiloxane having a viscosity varying from 100 to 500,000 centipoise at 25° C where the organo groups are monovalent hydrocarbon radicals; (b) from 5 to 200 parts by weight of a filler selected from reinforcing and extending fillers; (c) from 0.1 to 10 parts by weight of a metal oxide filler; (d) from 1 to 15 parts by weight of a cross-linking agent having the formula,

$$R\ SI\ (OR^1)_3$$

where R and R^1 are monovalent hydrocarbon radicals; (e) from 0.5 to 10 parts by weight of carbon black; (f) from 1 to 100 parts per million of platinum; and (g) from 0.01 to 5 parts by weight of a titanium chelate catalyst wherein the composition must contain from 0.01 to 10 mole percent of vinyl substitution based on the silanol end-stopped polymer.

4,102,853

FIRE-RETARDANT THERMOPLASTIC POLYESTER RESIN COMPOSITIONS AND METHOD FOR IMPARTING FIRE RETARDANCY TO POLYESTER RESINS

Takeo Kawamura; Noritsugu Saiki; Yoshitugu Nakamura, and Michiyuki Tokashiki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

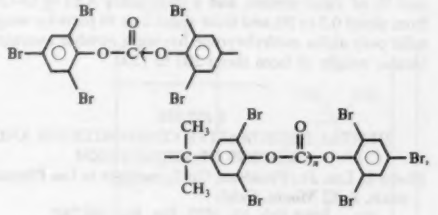
Filed Oct. 15, 1975, Ser. No. 622,498
Claims priority, application Japan, Oct. 17, 1974, 49-118706
Int. Cl.[2] C08K *3/22, 3/26, 5/03, 3/40*
U.S. Cl. 260—40 R **14 Claims**

1. A fire-retardant thermoplastic polyester resin composition which consists essentially of:

(A) 100 parts by weight of an aromatic polyester selected from the group consisting of polyethylene terephthalate, polytrimethylene, terephthalate, polytetramethylene terephthalate, polyhexamethylene terephthalate, polyethylene-2,6-naphthalate, polytetramethylene-2,6-naphthalate and mixtures thereof,

(B) from 20 to 100 parts by weight of an alkaline earth metal carbonate,

(C) from 0.5 to 30 parts by weight of a fire-retardant, selected from the group consisting of (1) a compound selected from the group consisting of halogen-substituted benzene compounds, halogen-substituted hydroxybenzene compounds, halogen-substituted biphenyl ether compounds, a compound of the following formula:



or a nuclearly brominated product of a low polymer of 2,2-bis[4-(2,3-epoxypropoxy) phenyl] propane, and bis-halogenated aralkyl compounds wherein the alkyl has from 1 to 6 carbon atoms and each of two hydrogen atoms, on the same or different carbon atom, is substituted by a halophenyl or halonaphthyl group and wherein, when the alkyl is methyl, one hydrogen atom may be substituted by a phenyl or cyclohexyl group and the halophenyl and halonaphthyl groups may include an inert substituent selected from the group consisting of nitro, hydroxyl and methoxy, (2) a combination of a compound of a metal of Group V*b* of the periodic table with a compound selected from (1), or (3) red phosphorous, and

(d) glass fibers present in not more than 120 parts by weight.

4,102,854

MULTICOMPONENT POLYOLEFIN-BLOCK COPOLYMER POLYCARBONATE BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,174, Feb. 7, 1977, Pat. No. 4,081,424, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,383

Int. Cl.[2] C08K 7/14

U.S. Cl. 260—42.18 30 Claims

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of a polycarbonate, and a polyolefin in a weight ratio of polyolefin to polycarbonate of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

a. said block copolymer comprises at least two monoalkenyl arene/polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of betwen about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

b. said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C.

4,102,855

COMPOSITIONS COMPRISING EPDM, E/VA AND POLY-ALPHA-METHYLSTYRENE

Tiong Ho Kuan, Akron, and John George Sommer, Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,166

Int. Cl.[2] C08L 23/16

U.S. Cl. 260—42.33 18 Claims

1. A curable processable composition comprising a blend of 100 parts by weight of an ethylene-propylene-diene rubbery polymer (EPDM) having a raw Mooney viscosity ML (1+4) at 121.1° C. of from about 25 to 100, a crystallinity at room temperature without stretching of from about 1.5 to 16% and an ethylene content of at least about 65 mole %; from about 5 to 30 parts by weight of an ethylene vinyl acetate copolymer having from about 25 to 62.5% crystallinity, from about 2 to 15 mol % of vinyl acetate, and a melt index ASTM D-1238 of from about 0.3 to 20; and from about 2 to 10 parts by weight of solid poly alpha methylstyrene having a number average molecular weight of from about 500 to 1200.

4,102,856

DENTAL RESTORATIVE COMPOSITIONS AND PROCESS OF USING THEM

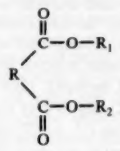
Henry L. Lee, Jr., Pasadena, Calif., assignor to Lee Pharmaceuticals, S. El Monte, Calif.

Filed Feb. 15, 1977, Ser. No. 768,765

Int. Cl.[2] C08K 3/36, 9/06

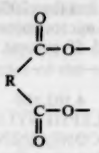
U.S. Cl. 260—42.53 23 Claims

1. A dental restorative composition comprising a finely divided filler admixed with a binder that can be activated to set and that comprises an adduct of the formula:



-continued

where:



is the residual moiety of an organic alicyclic o-dicarboxylic acid selected from the group consisting of substituted hydrogenated phthalic acids, lower alkyl-substituted hydrogenated phthalic acids, hexahydrophthalic acid, a maleic acid adduct of methylcyclopentadiene, and tetrahydrophthalic acid; and where, R_1 consists essentially of the residual moiety of a hydroxyalkyl ester of acrylic or methacrylic acid and R_2 consists essentially of the residual moiety of an epoxyalkyl ester of acrylic or methacrylic acid, the linkage of each of R_1 and R_2 to the adjacent respective oxygen on the residual moiety of the dicarboxylic acid being an ester linkage.

4,102,857

PYRAZOLE DERIVATIVES

Lajos Ávár, Biel-Benken; Kurt Hofer, Munchenstein, and Martin Preiswerk, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

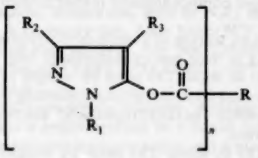
Continuation-in-part of Ser. No. 486,345, Jul. 8, 1974, Pat. No. 3,976,658. This application Aug. 20, 1976, Ser. No. 716,345

Claims priority, application Switzerland, Jul. 13, 1973, 10248/73

Int. Cl.[2] C08K 5/34

U.S. Cl. 260—45.8 N 16 Claims

3. A method of stabilizing an organic natural or synthetic polymeric material susceptible to degradation under the effect of ultraviolet light which comprises treating said material with a stabilizing effective amount of a compound of the formula,



wherein

R_1 is C_{1-22} alkyl, uninterrupted or interrupted by 1 or 2 sulfur atoms or by —COO—; C_{5-12} cycloalkyl; C_{6-12} cycloalkyl-alkyl, of which the alkyl moiety is uninterrupted or interrupted by 1 or 2 sulfur atoms or by —COO—; C_{7-12} aralkyl, of which the aryl nucleus is unsubstituted, monosubstituted by hydroxy, monosubstituted by C_{1-12} alkyl, disubstituted by C_{1-12} alkyl, monosubstituted by hydroxy and monosubstituted by C_{1-12} alkyl, or monosubstituted by hydroxy and disubstituted by C_{1-12} alkyl; unsubstituted phenyl; or phenyl substituted by one or more substituents independently selected from halo, cyano, hydroxy, C_{1-12} alkyl, C_{1-12} alkoxy, unsubstituted phenyl, R_4—O— and R_4—SO_2—, wherein R_4 is unsubstituted phenyl, phenyl monosubstituted by C_{1-8} alkyl or phenyl disubstituted by C_{1-8} alkyl, with the proviso that the maximum number of each substituent selected from cyano, hydroxy, unsubstituted phenyl, R_4—O— and R_4—SO_2— is one and the maximum number of each substituent selected from halo, C_{1-12} alkyl and C_{1-12} alkoxy is two;

R_2 is cyano; —$COOR_5$, wherein R_5 is C_{1-12} alkyl, C_{5-12} cycloalkyl, C_{6-12} cycloalkyl-alkyl, unsubstituted phenyl, phenyl monosubstituted by hydroxy, phenyl monosubstituted by C_{1-8} alkyl, phenyl disubstituted by C_{1-8} alkyl, phenyl mono-

substituted by hydroxy and monosubstituted by C_{1-8} alkyl, or phenyl monosubstituted by hydroxy and disubstituted by C_{1-8} alkyl; or one of the significances of R_1;

R_3 is hydrogen; $—COR_1$; $—COOR_5$; or one of the significances of R_1;

n is 1, 2 or 3; and

R, when n is 1, is unsubstituted phenyl; phenyl substituted by 1 to 3 substitutents independently selected from hydroxy, halo, unsubstituted phenyl, unsubstituted benzyl, unsubstituted phenoxy, C_{1-8} alkyl and C_{1-22} alkoxy, with the provisos that: a) the maximum number of each substitutent selected from hydroxy, unsubstituted phenyl, unsubstituted benzyl and unsubstituted phenoxy is one; b) when phenyl is di- or trisubstituted by C_{1-8} alkyl, the sum of the carbon atoms of the alkyl substitutents does not exceed 12; and c) when phenyl is di- or trisubstituted by C_{1-22} alkoxy, the sum of the carbon atoms of the alkoxy substitutents does not exceed 22; monovalent naphthalene; monovalent thiophene; monovalent benzothiophene; monovalent dibenzothiophene; monovalent furan; monovalent benzofuran; or monovalent dibenzofuran; and when n is 2, is unsubstituted phenylene; phenylene monosubstituted by C_{1-4} alkyl; phenylene monosubstituted by halo; phenylene monosubstituted by C_{1-4} alkyl and monosubstituted by halo; divalent naphthalene; divalent thiophene; or divalent dibenzofuran; and when n is 3, is 1,3,5-trivalent benzene.

4,102,858

2,2,6,6-TETRAMETHYL-4-PIPERIDYL THIOCARBOXYLATES AND AMINOCARBOXYLATES AND SYNTHETIC RESIN COMPOSITIONS CONTAINING THE SAME

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

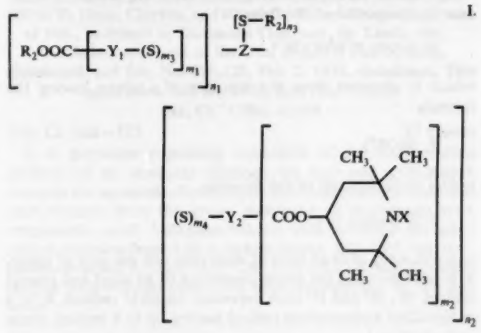
Filed Sep. 20, 1976, Ser. No. 724,793

Int. Cl.[2] **C07D** *211/06;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **58 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidyl thiocarboxylates are provided having the general formula:

I.



wherein:

m_1, m_3, and m_4 are numbers from 0 to 1;

m_2 is a number from 1 to 2;

n_1 is a number from 0 to 2;

n_2 is a number from 0 to 3;

n_3 is a number from 0 to 2;

R_1 is selected from the group consisting of alkyl, aralkyl, cycloalkyl and 2,2,6,6-tetramethyl-4-piperidyl;

R_2 is selected from the group consisting of alkyl, cycloalkyl, alkaryl, aralkyl, and hydroxy-substituted such radicals;

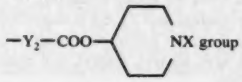
R_1 and R_2 have from one to about twenty carbon atoms;

X is hydrogen or O;

Y^1 and Y_2 are bivalent linking radicals having from one to about twenty carbon atoms, and selected from the group consisting of alkylene and cycloalkylene; and amino-substituted such radicals;

Z is an organic radical having a valence from 2 to 4 and from one to about twenty carbon atoms, and selected from the group consisting of alkylene, alkylidene, aralkylene, aralkylidene, alkarylene, alkarylidene, heterocycloalkylene, heterocycloalkylidene, cycloalkylene and cycloalkylidene; amino-substituted such radicals and 2,2,6,6-tetramethyl-4-piperidylidene;

there being from one to four sulfur-containing such groups and at least one



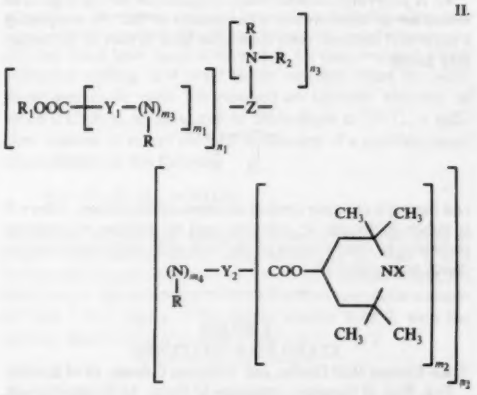
attached to the Z radical.

19. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a compound in accordance with claim 1.

29. A 2,2,6,6-tetramethyl-4-piperidyl aminocarboxylate having the formula:

II.



wherein:

m_1, m_3 and m_4 are numbers from 0 to 1;

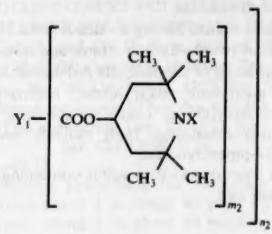
m_2 is a number from 1 to 2;

n_1 is a number from 0 to 2;

n_2 is a number from 0 to 3;

n_3 is a number from 0 to 2;

R is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, aralkyl, cycloalkyl, alkaryl, 2,2,6,6-tetramethyl-4-piperidyl, R_1OOCY_2, phenyl, hydroxy phenyl and



R_1 is selected from the group consisting of hydrogen, alkyl, aralkyl, cycloalkyl and 2,2,6,6-tetramethyl-4-piperidyl;

R_2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, and hydroxy-substituted such radicals;

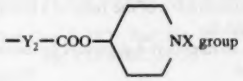
R (when other than hydrogen), R_1 and R_2 have from one to about twenty carbon atoms;

X is hydrogen or O·;

Y_1 and Y_2 are bivalent linking radicals having from one to about twenty carbon atoms, and selected from the group consisting of alkylene and cycloalkylene; and

Z is an organic radical having a valence from 2 to 4 and having from one to about twenty carbon atoms, and selected from the group consisting of alkylene, alkylidene, arylene, aralkylene, aralkylidene, alkarylene, alkarylidene, heterocycloalkylene, heterocycloalkylidene, cycloalkylene and cycloalkylidene;

there being from one to four nitrogen-containing such groups, and at least one



attached to the Z radical.

47. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a compound in accordance with claim 29.

4,102,859

STABILIZER MIXTURES

Erich Eimers; Rolf Dheim, and Wolfgang Cohnen, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 659,385, Feb. 19, 1976, abandoned. This application Jul. 22, 1976, Ser. No. 707,748

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1975, 2510463; Mar. 18, 1975, 2511730

Int. Cl.² C08K *5/52, 5/15*

U.S. Cl. 260—45.8 A **33 Claims**

1. A mixture comprising an oxetanyl free neutral ester of phosphorous acid and an oxetane compound and containing from 2 to 10 oxetane groups per phosphorus atom and wherein the oxetane compound is a compound of the formula

wherein each of the six groups R independently represents a hydrogen atom or a (C_1-C_{18})-alkyl, (C_3-C_{12})-cycloalkyl, (C_6-C_{15})-aryl, (C_7-C_{15})-aralkyl group or a group of the formula CH_2O-R^1 in which

R^1 represents a (C_1-C_{18})-alkyl, (C_6-C_{12})-cycloalkyl, (C_6-C_{15})-aryl, (C_7-C_{15})aralkyl, an acyl radical of a mono- or polybasic carboxylic acid, or the ester residue of an inorganic acid selected from the group consisting of boric, silicic, alkylboric, arylboric, stannoic, stibonic, orthophosphoric, pyrophosphoric, polyphosphoric, alkanephosphonic, arylphosphonic, dialkylphosphinic acids and of diarylphosphinic acids.

4,102,860

SILICON-TIN COMPOUNDS AS CONDENSATION CATALYSTS IN THE PREPARATION OF ORGANOPOLYSILOXANE ELASTOMERS

Ernst Wohlfarth; Wolfgang Hechtl, and Paul Hittmair, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Division of Ser. No. 690,683, May 27, 1976. This application Dec. 30, 1976, Ser. No. 755,532

Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524000

Int. Cl.² C08G *77/04*

U.S. Cl. 528—18 **8 Claims**

1. An organopolysiloxane composition capable of being cured to an elastomeric solid at room temperature in atmospheric moisture comprising a hydroxyl-terminated diorganopolysiloxane, a silicon compound capable of crosslinking with the diorganopolysiloxane and from 0.01 to 10 percent by weight based on the total weight of the composition of a silicon-tin compound of the formula

$$R_a Si(OSn\ R^1R^2OOCR^3)_{4-a}$$

which is obtained from the reaction of a silane having the formula

$$R_a Si(OR^4)_{4-a}$$

with a dialkyltin salt of the formula

$$R^1R^2\ Sn(OOCR^3)_2$$

in a mol ratio of (4-a) mols of dialkyltin salt per mol of silane, R is selected from the group consisting of an alkyl and phenyl radical, R^1, R^2 and R^3 each represent an alkyl radical, R^4 is a monovalent hydrocarbon radical having up to 4 carbon atoms and *a* is 0 or 1.

4,102,861

EXTRUSION STABILIZATION OF POLYPYRROLIDONE BY HYDROQUINONES

Carroll J. Wedel, Wainut Creek, and Phillip H. Parker, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 29, 1976, Ser. No. 745,891

Int. Cl.² C08K *5/13*

U.S. Cl. 260—45.95 E **14 Claims**

1. A composition of matter comprising a major amount of normally solid poly-2-pyrrolidone and a thermal stabilizing amount of a hydroquinone compound selected from the group

consisting of hydroquinone; C_1–C_{25} alkylhydroquinone; and mixtures thereof, effective to reduce the thermal degradation of said poly-2-pyrrolidone to its monomer.

4,102,862

APPLICATION OF CUMYLPHENOL AND DERIVATIVES THEREOF IN PLASTIC COMPOSITIONS

Salvatore J. Monte, Staten Island, N.Y., and Gerald Sugerman, Allendale, N.J., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed Mar. 31, 1976, Ser. No. 672,425
Int. Cl.[2] C08G 59/56
U.S. Cl. 528—88 **14 Claims**

1. In a process for curing epoxy resins with an amine curing system, the improvement of polymerizing the resin in the presence of an accelerating amount of cumylphenol or a carboxylic acid ester thereof.

12. The product obtained by curing a mixture comprising (A) 100 parts by weight of an epoxy resin, (B) 10 to 200 parts by weight of cumylphenol or a carboxylic acid ester or glycidyl ether thereof, and (C) and epoxy resin curing agent.

4,102,863

CATIONIC ELECTRODEPOSITION USING AQUEOUS DISPERSIONS OF QUATERNARY AMMONIUM CARBONATE-CONTAINING POLYMERS

Stephen L. Buchwalter, Allison Park; Joseph F. Bosso, Lower Burrell, and Roger M. Christenson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,533
Int. Cl.[2] C08G 65/26, 59/00
U.S. Cl. 528—111 **4 Claims**

1. A water-dispersible, quaternary ammonium salt-containing resin comprising the reaction product of:
(A) a polyglycidyl ether of a polyphenol, and
(B) an amine carbonate salt.

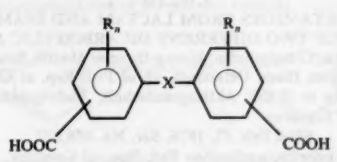
4,102,864

POLYESTERS OF 1,2-BIS(HYDROXYPHENYL) ETHANES AND AROMATIC DICARBOXYLIC ACIDS

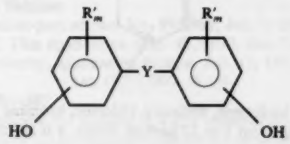
Oliver D. Deex, Clayton, and Virgil W. Weiss, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 654,127, Feb. 2, 1976, abandoned, and Ser. No. 654,128, Feb. 2, 1976, abandoned. This application Jul. 28, 1976, Ser. No. 709,469
Int. Cl.[2] C08G 63/18
U.S. Cl. 528—173 **37 Claims**

1. A polyester consisting essentially of the condensation product of an aromatic dicarboxylic acid and a diphenol; wherein the aromatic dicarboxylic acid comprises at least one acid selected from the group consisting of isophthalic acid, terephthalic acid, 5-alkylisophthalic acid, wherein the alkyl radical contains from 1 to 6 carbon atoms, 3,3'-, 3,4'- and 4,4'-bibenzoic acids, 1,3-, 1,4-, 1,5-, 1,6-, 1,7-, 1,8-, 2,6- and 2,7-naphthalene dicarboxylic acids, and acids represented by the formula:



wherein the carboxyl groups are in the 3- or 4- positions, X is O, S, SO_2, C=O, CH_2, CH_2CH_2, $CH(CH_3)$ or $C(CH_3)_2$, R is H or a C_1 to C_6 alkyl radical, R groups ortho to a carboxyl are small enough to permit esterification, R substituents ortho to X are limited to one ring and $n = 0$ to 2; wherein the diphenol comprises from about 60 to 100 mol percent of a 1,2-bis(hydroxyphenyl)ethane in which the hydroxyl groups are in the 3- or 4- positions and from about 40 to 0 mol percent of a diphenol selected from the group consisting of resorcinol, hydroquinone, 3,3'-, 3,4'- and 4,4'-diphenols, 1,3-, 1,4-, 1,5-, 1,6-, 1,7-, 1,8-, 2,6- and 2,7-dihydroxynaphthalenes, and diphenols represented by the formula:



wherein the hydroxyl groups are in the 3- or 4- positions, Y is O, S, SO_2, C=O, CH_2, $CH(CH_3)$, $C(CH_3)_2$ or $(CH_2)_3$, R' is H or a C_1 to C_6 alkyl radical, R' substituents ortho to Y are limited to one ring, R' substituents ortho to hydroxyl are small enough to permit esterification and $m = 0$ to 4; and wherein the melt viscosity of the polyester at 320° C. determined at a shear rate of 100 $sec.^{-1}$ with a capillary rheometer is less than about 10^5 poise.

4,102,865

MODERATION OF MANGANESE CHELATE CATALYZED POLYMERIZATION OF PHENOLIC MONOMERS WITH POLYFUNCTIONAL ALKANOLAMINES

Walter Karl Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,544
Int. Cl.[2] C08G 65/44
U.S. Cl. 528—215 **17 Claims**

1. In a process for the preparation of a polyphenylene oxide resin which comprises the step of oxidatively coupling a phenolic monomer to form a polyphenylene oxide resin in the presence of an organic solvent and a manganese (II) chelate catalyst of the formula

$$(L)_x\,Mn$$

wherein L is a ligand derived from an ω-hydroxyoxime in a conventional manner, Mn is the transition metal manganese (II) and x is at least equal to about 0.5; the improvement which comprises adding, at a point in the reaction when the polyphenylene oxide resin has reached an intrinsic viscosity of about 0.15 dl/g, as measured in chloroform at 30° C., a sufficient amount to retard the rate of reaction of a polyfunctional alkanolamine of the formula:

$$R^1{}_r\text{—}N\text{—}C_nH_{2n}\text{—}OH)_m)_p$$

wherein R^1 is hydrogen, straight or branched chain alkylene of from 1 to 6 carbon atoms, alkylenehydroxy of from 2 to 4 carbon atoms, aminoalkylene of from 1 to 6 carbon atoms; r is 0 or 1; n is a whole number of from 2 to 4; m is a whole number of from 1 to 3; and p is the whole number 1 or 2, with the proviso that when p is 2, m is 1, and r is 1, m is 2.

4,102,866

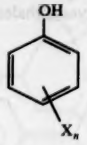
METHOD OF MAKING GLYCIDYL ETHERS OF NOVOLAK RESINS

George P. Speranza, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,809
Int. Cl.[2] C08G 59/08
U.S. Cl. 528—135 **6 Claims**

1. A glycidyl ether composition useful as an epoxy resin which comprises the reaction product of an epihalohydrin and a novolak resin containing 5–25 weight percent of phenol or

substituted phenol based on the weight of said novolak resin said phenol or substituted phenol having the structure:



wherein X is hydrogen, hydroxy, chlorine, bromine or an alkyl radical having from 1 to 12 carbon atoms; *n* is an integer from 1 to 2.

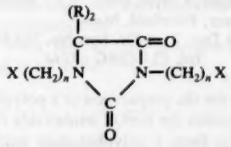
4,102,867

COPOLYESTERS OF PHTHALIC ACIDS AND HYDANTOINS

Harold Roy Penton, Jr., and Kenneth Boone Wagener, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 15, 1976, Ser. No. 742,161
Int. Cl.² C08G *63/68*
U.S. Cl. 528—289 **13 Claims**

1. A disperse dyeable, water-absorbent polyethylene phthalate copolyester comprising units randomly spaced in its chain obtained by esterification of a phthalic acid or diester thereof and ethylene glycol with a hydantoin of the formula



wherein R is hydrogen, lower alkyl, aryl, aralkyl, alkaryl or heterocyclic group which may be the same or different, X is —OH, —COOH or —COOR, R_1 is lower alkyl, *n* is an interger of 1 to 6 when X is —COOH or —$COOR_1$ and *n* is an integer of 2 to 6 when X is —OH.

6. A method for improving the disperse dyeability of a polyethylene phthalate based polyester which comprises simultaneously esterifying a phthalic acid monomer or diester thereof, ethylene glycol and a monomeric hydantoin diacid, hydantoin diester of hydantion diol to form a copolyester containing in its chain randomly spaced units derived from the hydantoin.

4,102,868

COMPOSITION AND PROCESS FOR THE PREPARATION OF SEGMENTED POLYESTER-URETHANE POLYMERS

Ralph A. Genetti, Copley, and Chester D. Trivette, Jr., Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1976, Ser. No. 714,626
Int. Cl.² C08G *18/08, 18/42*
U.S. Cl. 260—858 **37 Claims**

1. A process for the preparation of elastoplastic urethane polymer comprising heating a slurry of

(a) about 10 to about 90 parts by weight of at least one liquid polydiol having a melting or softening point of about 100° C or below and a molecular weight of from about 500 to about 12,000 selected from the group consisting of dihydroxy polyether and dihydroxy polyester,

(b) about 90 to about 10 parts by weight of a pulverulent solid dihydroxy polyester having a melting point of at least 200° C and a molecular weight of from about 500 to about 12,000, per 100 total parts by weight of (a) and (b) and

(c) an organic diisocyanate in the quantity such that the number of NCO groups is equal to or exceeds the number of OH groups of (a) and (b), to a temperature sufficient to melt (b) for a time sufficient to form an essentially linear segmented urethane polymer, and cooling the polymer before substantial degradation occurs.

4,102,869

FAST-CURING COATING COMPOSITIONS

Michael Allan Tobias, Bridgewater, and Conrad Linden Lynch, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,386
Int. Cl.² C08G *63/18*
U.S. Cl. 427—178 **13 Claims**

1. A process for preparing a linear polyester resin suitable for making water-reducible, heat-curable fluid coating composition which comprises performing a linear polyester resin terminated with carboxyl groups and reacting said preformed linear polyester resin with an amount of hydrocarbyl glycidyl ether sufficient to cap 5 to 49 percent of said terminal carboxyl groups, thereby increasing the curing rate of said linear polyester resin.

6. A water-reducible, heat-curable fluid coating composition comprising a linear polyester resin terminated with a major fraction of carboxyl groups and a minor fraction of carboxyl esters of a hydrocarbyl glycidyl ether, and an amount of cross-linking agent effective to cross-link said linear polyester resin.

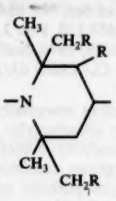
4,102,870

MODIFIED POLYURETHANES WITH INCREASED LIGHT STABILITY

Peter Hofmann, Basel; Helmut Müller, Binningen, and Jean Rody, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 4, 1977, Ser. No. 793,707
Claims priority, application Switzerland, May 11, 1976, 5891/76
Int. Cl.² C08G *18/38*
U.S. Cl. 528—73 **9 Claims**

1. Polyurethanes which are stabilised against light degradation and contain in the polymer molecule the grouping



in which R denotes hydrogen or alkyl with 1-5 C atoms.

4,102,871

COPOLYAMIDES FROM LACTAM AND DIAMINE SALTS OF TWO DIFFERENT DICARBOXYLIC ACIDS

Peter Horn, Ludwigshafen; Hanns-Dietmar Haertl, Bruehl, and Karl Heinz Illers, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 17, 1976, Ser. No. 658,527
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1975, 2509791
Int. Cl.² C08G *69/14*
U.S. Cl. 528—324 **2 Claims**

1. A copolyamide hot-melt adhesive consisting essentially of the polymeric condensation product of

A. from 20 to 60 percent by weight based on the weight of copolyamide, of caprolactam and

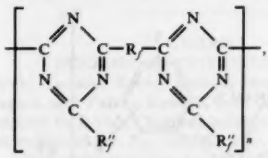
B. from 80 to 40 percent by weight based on the weight of copolyamide, of a mixture of
(a) the piperazine salt of adipic acid and
(b) a salt chosen from the group consisting of the piperazine salt of dodecanedicarboxylic acid, the 2,2-bis-4-aminocyclohexyl-propane salt of dodecanedicarboxylic acid and the bis-hexamethylenetriamine salt of dodecanedicarboxylic acid, wherein the weight ratio of constituent (a) to constituents (b) in component B) is from 25 to 35 : 35 to 45.

4,102,872
FLUOROCARBON TRIAZINE POLYMERS

Warren R. Griffin, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,561
Int. Cl.[2] C08G *73/06, 73/00*
U.S. Cl. 528—362 **7 Claims**

1. A linear fluorocarbon triazine polymer consisting essentially of recurring units having the following formula:



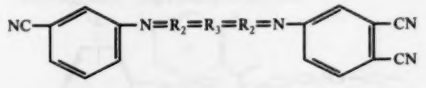
in which R_f is $-(CF_2)_4OCH_2(CF_2)_3CH_2O(CF_2)_4-$ or $-(CF_2)_4OCH_2(CF_2)_4OCH_2-$ $(CF_2)_3CH_2O(CF_2)_4CH_2O(CF_2)_4-$; R_f' is a perfluoroalkyl radical containing 1 to 12, inclusive, carbon atoms; and n is an integer equal to the number of recurring units.

4,102,873
ELECTRICAL CONDUCTING PHTHALONITRILE POLYMERS

James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 681,087, Apr. 28, 1976, Pat. No. 4,057,569. This application Oct. 20, 1977, Ser. No. 843,907
Int. Cl.[2] C08G *73/00*
U.S. Cl. 528—331 **9 Claims**

1. A cyano-condensation resin obtained by heating one or more bisorthodinitriles of the general formula



wherein R_2 is an isomer of an aromatic dialdehyde selected from the class consisting of phthalaldehyde, napthalene dialdehyde, phenanthrene dialdehyde, anthracene dialdehyde, diphenyl dialdehyde and terphenyl dialdehyde; and R_3 is an isomer of an aromatic diamine selected from the class consisting of benzene diamine, napthalene diamine, phenanthrene diamine, biphenyl diamine, terphenyl diamine to a temperature above the melting point thereof.

4,102,874
PREPARATION OF ORGANIC POLYSULFIDE POLYMERS USING HEAVY RESIDUES FROM VINYLCHLORIDE MANUFACTURE

Fernand Peerts, Heverlee, and Yvon Delaunois, Tessenderlo, both of Belgium, assignors to Tessenderlo Chemie S.A., Tessenderlo, Belgium

Continuation-in-part of Ser. No. 593,385, Jul. 7, 1975, Pat. No. 4,025,495. This application May 10, 1977, Ser. No. 795,600
Claims priority, application France, Jul. 11, 1974, 74 24082
Int. Cl.[2] C08G *75/16*
U.S. Cl. 528—387 **13 Claims**

1. In a process for abating a waste disposal problem in the manufacture of vinyl chloride wherein 1,2 dichloroethane is an intermediate and a heavy residue is recovered as still bottoms, from the purification by distillation of dichloroethane and/or vinyl chloride having an organic-origin chloride content ranging between 55 and 80% by weight, said process comprising reacting said heavy residue at 50° to 100° C., in aqueous medium with an alkali metal or an alkaline earth metal polysulfide, the proportion of polysulfide being equal at least to 30% by weight of the molar theoretical quantity, the average sulfur rank of polysulfide being more than 1 and up to and including 5, the pH of the reaction medium not exceeding 10.5 when the reaction is completed, and the obtained precipitate being separated from the reaction mother liquor, said precipitate being organic polysulfide polymers containing 4–80% by weight of sulfur
wherein the improvement comprises the intermediate steps prior to the separation of the precipitate from the mother liquor of:
(a) at the end of the reaction, adding an additional quantity of heavy residue amounting to 10–80% by weight of the quantity of the initially added heavy residue; and
(b) acidifying the reaction medium to a pH lower than 5 to coagulate the resultant polymer precipitate.

4,102,875
AROMATIC SULFIDE/SULFONE POLYMER PRODUCTION

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1976, Ser. No. 698,576
Int. Cl.[2] C08G *75/16*
U.S. Cl. 528—388 **8 Claims**

1. A process for the production of aromatic sulfide/sulfone polymers of increased molecular weight which comprises contacting without a prior dehydration step to remove water a mixture consisting essentially of
(a) at least one dihalo aromatic sulfone,
(b) at least one at least partially hydrated alkali metal sulfide selected from the group consisting of sodium sulfide, potassium sulfide, rubidium sulfide, and cesium sulfide, and
(c) at least one organic amide under polymerization conditions for a period of time sufficient to form a high molecular weight aromatic sulfide/sulfone polymer.

4,102,876
QUATERNARY PHOSPHONIUM IONOMERS

Douglas Brenner, Livingston, and Alexis A. Oswald, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 18, 1977, Ser. No. 788,312
Int. Cl.[2] C08G *75/00;* **C08L** *19/00*
U.S. Cl. 526—19 **24 Claims**

1. Ionomers having the general formula

wherein C is one of a plurality of carbon atoms comprising a

portion of the polymer backbone chain of carbon atoms or is in an acyclid, alicyclic or aromatic radical which is pendant to the backbone chain and wherein said ~C~ is (1) in a single polymer molecule, (2) in the same polymer molecule, and (3) in different polymer molecules; A is one or more anionic acid radicals covalently bonded to one or more of said ~C~ carbon atoms; and (F)+ is one or more mono or polyvalent quaternary phosphonium cationic counterions partially or completely neutralizing said anionic acid radicals.

4,102,877
CYCLIZATION OF PEPTIDES

Ruth F. Nutt, Green Lane, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 28, 1976, Ser. No. 709,568
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R **1 Claim**

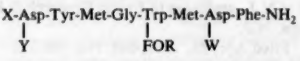
1. The process which comprises dissolving one part of a peptide, selected from the group consisting of the linear hexapeptide L-leu-gly-L-pro-L-phe-L-ala-gly, and the protected linear decapeptide L-val-(tos)-L-orn-L-leu-D-phe-L-pro-L-val-(tos)-L-orn-L-leu-D-phe-L-pro in a substantially anhydrous polar organic solvent comprising dimethylformamide adjusted to a pH of about 6–8 with triethylamine; suspending in this solution about one to fifteen parts of isopropylcarbodiimide bound to an insoluble polystyrene resin-support; stirring the resulting mixture at a temperature of about 25° C. for a period of about 15 to 36 hours, whereupon a peptide-cyclizing reaction occurs to produce a reaction mixture consisting of the insoluble resin-support (having bound thereon substantially all by-products formed in the reaction) suspended in a solution of the corresponding cyclic peptide, selected from the group consisting of cyclo-(L-leu-gly-L-pro-L-phe-L-ala-gly) and cyclo-(L-val-(tos)-L-orn-L-leu-D-phe-L-pro-L-val-(tos)-L-orn-L-leu-D-phe-L-pro), substantially free of said by-product impurities; separating the insoluble resin-support from the solution of said cyclic peptide; and evaporating this solution to produce the said cyclic peptide in substantially pure form, and in substantially quantitative yield.

4,102,878
PROCESS FOR THE PREPARATION OF THE CHOLECYSTOKININ-PANCREOZYMIN OCTAPEPTIDE AMIDE SULFATE ESTER

Botond Penke; Lajos Balaspiri, both of Szeged, Hungary; Péter Pallai, Rockville, Md.; Kálmán Kovács, Szeged, Hungary; Vince Varró, Szeged, Hungary; János Lonovics, Szeged, Hungary; László Varga, Szeged, Hungary; György Dobó, Budapest, Hungary; Géza Iványi, Taksony, Hungary; Lajos Kovács, Budapest, Hungary; Miklós Löw, Budapest, Hungary, and Judit Löw, née Kaloczy, Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 28, 1977, Ser. No. 792,043
Claims priority, application Hungary, May 5, 1976, RI 589
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R **5 Claims**

1. A process for the preparation of L-aspartyl-(O-sulfato-L-tyrosyl)-L-methionyl-glycyl-L-tryptophyl-L-methionyl-L-aspartyl-L-phenylalanine amide, which comprises treating the protected octapeptide amide of the formula



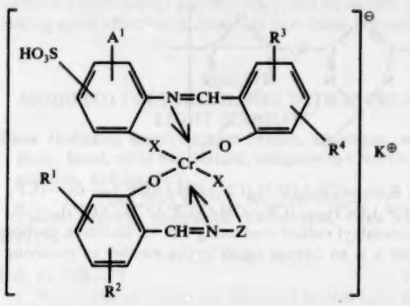
wherein
X is BOC, Cbz or Ddz,
Y is O^{t}Bu, OBzl or OH and
W is O^t Bu, OBzl or OH,
a catalytically effective ether solvent in the presence of an ether with excess of a complex compound sulfur trioxide and a tertiary amine containing at least one alkyl group, converting the obtained sulfate ester of the protected octapeptide amide into an alkali metal salt and simultaneously removing the formyl group from the tryptophan unit by reacting the sulfate ester with an alkali metal hydroxide, and then splitting off the remaining protective groups by acidolysis.

4,102,879
UNSYMMETRICAL AZOMETHINE 1:2-CHROMIUM COMPLEX DYES

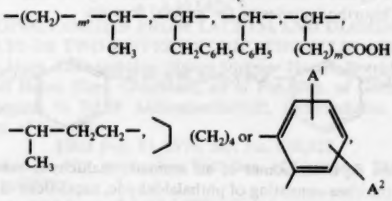
Hans Baumann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 29, 1975, Ser. No. 644,958
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501469
Int. Cl.[2] C09B *45/16, 55/00*; C07F *11/00*
U.S. Cl. 260—149 **6 Claims**

1. an unsymmetric azomethine 1:2-chromium complex dye of the formula



wherein the anion is shown in its free acid form,
A^1 is hydrogen, hydroxysulfonyl, chlorine, bromine, methyl, methoxy, ethoxy, nitro, alkanoylamino of 1 to 4 carbon atoms or benzoylamino, R^1 is hydrogen, chlorine, bromine, nitro, hydroxysulfonyl, phenylazo, phenylazo substituted by chlorine, bromine, methyl, methoxy, ethoxy, nitro or hydroxysulfonyl, or naphthylazo substituted by hydroxysulfonyl, R^2 is hydrogen, chlorine, bromine or nitro, R^1 and R^2 together are a fused benzene ring, R^3 and R^4 independently of one another have the meanings given for R^1 and R^2,
X is —O— or —COO—,
Z is



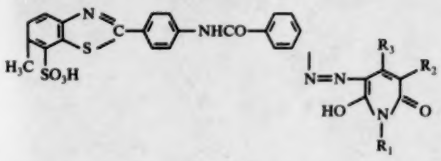
A^2 is hydrogen, chlorine, bromine, sulfamoyl or sulfamoyl substituted once or twice by C_1— to C_4-alkyl, phenyl, tetra-, penta- or hexamethylene or —CH_2—$CH_2OCH_2CH_2$—, *m* is 1, 2 or 3, and
K is a cation.

4,102,880
BENZOYLATED DEHYDROTHIO-P-TOLUIDINE SULFONIC ACID-AZO-PYRIDONE DYES

Karl Seitz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 5, 1977, Ser. No. 794,286
Claims priority, application Switzerland, May 21, 1976, 6446/76
Int. Cl.[2] C09B *29/36;* D06P *1/06, 3/16, 3/24*
U.S. Cl. 260—156 3 Claims

1. An azo dye of the formula



wherein R_1 is hydrogen, alkyl, cyclohexyl, β-aminoethyl or β-hydroxyethyl;

R_2 is hydrogen, cyano, chloro, sulfo, carbamoyl, sulfoalkyl, nitro, acetylamino or chloroacetylaminomethyl; and

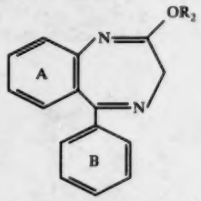
R_3 is alkyl, 4'-methoxy-3'-sulfophenyl, or sulfomethyl.

4,102,881
BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto; Hideaki Natsugari, Osaka; Kanji Meguro, and Yutaka Kuwada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

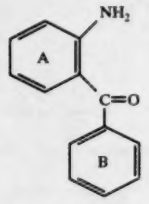
Continuation of Ser. No. 128,507, Mar. 26, 1971, abandoned.
This application Jun. 12, 1974, Ser. No. 478,823
Claims priority, application Japan, Mar. 27, 1970, 50-25804; Mar. 27, 1970, 50-25805; Apr. 23, 1970, 50-34950; May 28, 1970, 50-46637
Int. Cl.[2] C07D *243/48*
U.S. Cl. 260—239 BD 3 Claims

1. A process for producing a compound of the formula



wherein R_2 is lower alkyl and each of rings A and B is unsubstituted or substituted by a member selected from the group consisting of nitro, trifluoromethyl, halogen, alkyl having up to 4 carbon atoms and alkoxy having up to 4 carbon atoms, which consists essentially of

reacting a compound of the formula

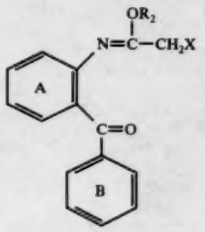


wherein rings A and B are as defined above, with a compound of the formula

$$XCH_2C(OR_2)_3$$

wherein X is halogen and R_2 is as defined above,

isolating and reacting the resultant compound of the formula

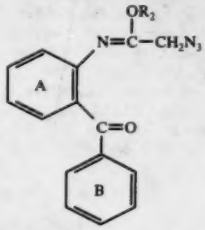


wherein X, R_2 and rings A and B are as defined above, with a compound of the formula

$$MN_3$$

wherein M is an alkali metal, and

isolating and subjecting the resultant compound of the formula



wherein R_2 and rings A and B are as defined above, to reductive ring-closure in the presence of a solvent and a reducing agent selected from the group consisting of (1) a compound of the formula

$$P(R_4)_3$$

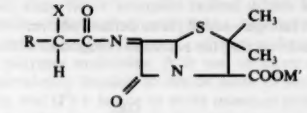
wherein R_4 is alkyl having 1–4 carbon atoms, benzyl or phenyl, and (2) a combination of zinc powder and aqueous ammonium chloride, at a temperature of from room temperature to the boiling point of the solvent.

4,102,882
PROCESS TO PREPARE NOVEL ANTIBIOTIC COMPOUNDS

Raymond A. Firestone, Fanwood; Lovji D. Cama, and Burton G. Christensen, both of Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 615,856, Sep. 23, 1975, Pat. No. 4,041,029, which is a division of Ser. No. 340,803, Mar. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 203,056, Nov. 29, 1971, abandoned. This application Feb. 14, 1977, Ser. No. 768,234
Int. Cl.[2] C07D *499/68, 499/70, 499/02*
U.S. Cl. 260—239.1 2 Claims

1. The compound



wherein R is a phenyl or thienyl or furyl;
X is hydrogen, amino, or carboxyl;
M' is benzyl, benzhydryl, trimethylsilyl, trichloroethyl, methoxymethyl, benzoylmethyl, or methoxybenzyl.

4,102,883

19,8-LACTONE STEROID DERIVATIVES AND PROCESSES OF PREPARATION THEREOF

Gunther Kruger, St. Laurent, Canada, assignor to Steele Chemicals Co. Ltd., Pointe Claire, Canada

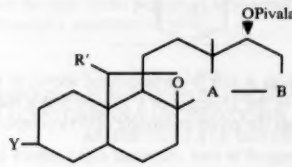
Continuation-in-part of Ser. No. 497,724, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 215,669, Jan. 5, 1972, Pat. No. 3,849,402. This application Jul. 9, 1976, Ser. No. 703,824

Claims priority, application Canada, Jan. 4, 1972, 131674

Int. Cl.[2] **C07J** *71/00*

U.S. Cl. 260—239.55 R **23 Claims**

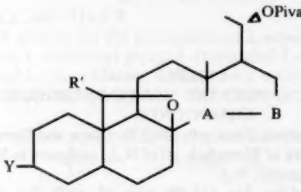
1. A compound of the formula



(I)

wherein A and B represent 14- and 15-carbon atoms, respectively, which are either linked by a double bond, or which carry an α- or β-oxido or a 14α- or β-hydroxy group in which case B is a methylene group; Y is =O, 3α or 3β-OH, ^{2}H, ^{3}H, O-alkyl, O-acyl or H; R' is OH, =O or acetoxy; the 5-hydrogen atom is either in the α or β position; and the Δ4, Δ5(6) and Δ6 dehydro derivatives thereof.

2. A compound of the formula



(II)

wherein A and B represent 14- and 15-carbon atoms, respectively, which are either linked by a double bond, or which carry an α- or β-oxido or a 14α- or β-hydroxy group in which case B is a methylene group; Y is =O, 3α or 3β-OH, ^{2}H, ^{3}H, O-alkyl, O-acyl or H; R' is OH, =O or acetoxy; the 5-hydrogen atom is either in the α or β position; and the Δ4, Δ5(6) and the Δ7 derivatives thereof.

4,102,884

14 β-HYDROXY 3-DEOXYCARDENOLIDES

Gunther Kruger, St. Laurent, Canada, assignor to Steele Chemicals Co. Ltd., Pointe Claire, Canada

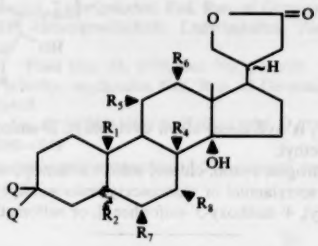
Filed May 5, 1976, Ser. No. 683,843

Claims priority, application United Kingdom, May 7, 1975, 19144/75

Int. Cl.[2] **C07J** *17/00*

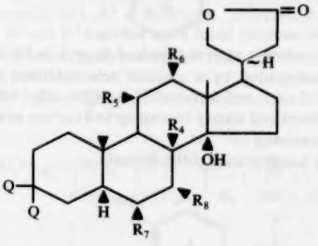
U.S. Cl. 260—239.57 **51 Claims**

1. A 19-oxygenated steroid compound of the formula



wherein
Q is selected from the group consisting of hydrogen, deuterium and tritium;
R_1 is selected from the group consisting of CH_2OH, the tetrahydropyranyl ether of CH_2OH, the p-toluenesulfonate of CH_2OH, CHO, CH_2Br, COOH, $COOCH_3$ and CH_2O-acyl, wherein acyl is formyl, acetyl, heptafluoropropionyl, pivalyl, heminalonyl or hemisuccinyl;
R_2 is α or β—H;
R_4, R_5, R_7 and R_8 are each selected from the group consisting of H and OH;
R_6 is H, OH or =O; and
the Δ1, Δ2, Δ3, Δ4, Δ5(6), Δ6, Δ7, Δ9(11), Δ11 and Δ20(22) dehydro analogues thereof.

3. A 19-methyl steroid compound of the formula



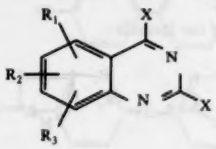
wherein
Q is selected from the group consisting of deuterium and tritium;
R_4, R_5, R_7 and R_8 are each selected from the group consisting of H and OH; and
R_6 is selected from the group consisting of H, OH, =O, acetoxy and formyloxy with the proviso that when R_6 is H, Q is other than H; and
the Δ1, Δ2, Δ3, Δ4, Δ5(6), Δ6, Δ7, Δ9(11), Δ11 and Δ20(22) dehydro analogues thereof.

4,102,885
PROCESS FOR PREPARING 2,4-DIHALOQUINAZOLINES

Ronnie Ray Crenshaw, Dewitt; George Michael Luke, Lafayette, and Richard Anthony Partyka, Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 807,938
Int. Cl.[2] C07D *239/95*
U.S. Cl. 544—283 10 Claims

1. A process for preparing a compound of formula I



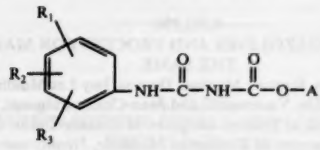
(I)

wherein

X is halogen selected from the group consisting of chlorine and bromine; and

R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms inclusive and lower alkoxy of 1 to 4 carbon atoms inclusive;

which comprises treating a compound of formula II



(II)

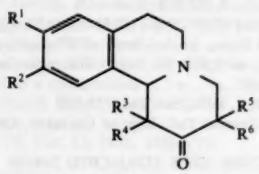
wherein R_1, R_2 and R_3 are as above and A is methyl or phenyl with a reagent selected from the group consisting of (a) hydrogen chloride in phosphorus oxychloride, (b) hydrogen bromide in phosphorus oxybromide, (c) phosphorus oxychloride and N,N-dimethylaniline, and (d) phosphorus oxybromide and N,N-dimethylaniline and thereafter completing the cyclization and halogenation reaction by heating at reflux temperature to produce the quinazoline compound of formula I.

4,102,886
PROCESS FOR THE PREPARATION OF BENZO(a)QUINOLIZIDINE DERIVATIVES

Csaba Szantay; Lajos Szabo; Laszlo Toke; Istvan Toth; Sandor Virag; Erzsebet Kanyo, and Agoston David, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Oct. 21, 1975, Ser. No. 624,470
Claims priority, application Hungary, Oct. 23, 1974, CI 1514; Sep. 11, 1975, CI 1603
Int. Cl.[2] C07D *455/06*
U.S. Cl. 260—287 CF 3 Claims

1. A process for the preparation of a compound of the formula



(I)

or a salt thereof wherein

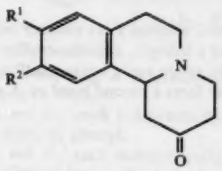
R^1 and R^2 are each hydrogen or a C_1 to C_4 alkoxy group, or together form a methylenedioxy group;

one of R^3, R^4, R^5 and R^6 is $-(CH_2)-(CH_2)_n-R^7$ and each remaining moiety is a hydrogen;

R^7 is cyano, carboxy or alkoxycarbonyl wherein the alkoxy group has 1 to 7 carbon atoms; and

n is 0,1 or 2; which comprises the steps of

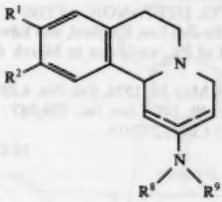
(a) reacting a compound of the formula



(II)

with an organic secondary amine;

(b) reacting in a predetermined solvent the resulting enamine



(III)

thus obtained, wherein R^8 and R^9 each represent a C_1 to C_5 alkyl group, or together with the adjacent nitrogen atom form a 5- or 6- membered heterocyclic ring, with a compound of the formula:

$$CH_2{=}CH{-}(CH_2)_n{-}R^{10} \qquad \text{(IV)}$$

wherein R^{10} is a cyano group, carboxy or alkoxycarbonyl wherein the alkoxy group has 1 to 7 carbon atoms; and

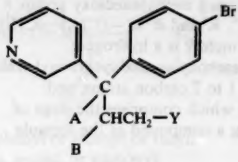
(c) treating the reaction mixture of step (b) with water to yield the compound of Formula I or said salt thereof, wherein the position of substitution in step (b) is determined by the use of a polar protic solvent for causing substitution at R^5 or R^6 and an apolar solvent for causing substitution at R^3 or R^4.

4,102,887
INTERMEDIATES USED IN THE PREPARATION OF PHENYL-PYRIDYLAMINE DERIVATIVES

Per Arvid Emil Carlsson, Torild Wulffsgatan 50, S-143 19 Göteborg; Bernt Sigfrid Emanuel Carnmalm, Tornrosavagen 14; Svante Bertil Ross, Hedvagen 8, both of, S-151 52 Södertalje, and Carl Bengt Johan Ulff, Agardevagen 9, S-151 47 Sodertalje, all of Sweden

Continuation-in-part of Ser. No. 632,698, Nov. 17, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,056
Claims priority, application Sweden, Nov. 21, 1974, 7414622
Int. Cl.[2] C07D *213/26, 213/52*
U.S. Cl. 260—290 HL 5 Claims

1. A compound useful as an intermediate for the preparation of therapeutically valuable phenyl-pyridyl derivatives, which compound is characterized by the formula



or an acid addition salt thereof, wherein Y is a member selected from the group consisting of a halogen, a methanesulfonyloxy group, a toluenesulfonlyloxy group and a benzenesulfonyloxy group and A and B together form a second bond or A is OH and B is H.

4,102,888

3-THIAZOLIDINYL HEPTANOIC ACIDS

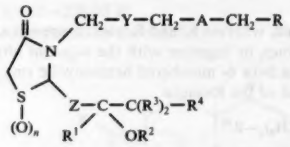
Robert L. Smith, Lansdale; Ta-Jyh Lee, Hatfield, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 689,311, May 24, 1976, Pat. No. 4,059,587. This application Apr. 20, 1977, Ser. No. 789,047

Int. Cl.[2] C07D *277/14*

U.S. Cl. 260—294.8 D **16 Claims**

1. The compound of the formula



wherein

R is carboxy, a carboxy salt having the formula $-COO^-M^+$ in which M is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy in which R is selected from alkoxycarbonyl ($—COOR^5$ wherein R^5 is alkyl having 1–10 carbon atoms), carbamoyl ($—CO_2NH_2$), substituted carbamoyl ($—CONR^6R^7$ wherein R^6 and R^7 are selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, and diloweralkylaminoalkyl having 4–7 carbon atoms), and carbazoyl ($—CONHNH_2$);

A is selected from the group consisting of methylene and oxygen;

Y is selected from the group consisting of ethylene, vinylene, and ethynylene;

n is 0, 1, or 2;

Z is selected from the group consisting of ethylene and vinylene;

R^1 is hydrogen or methyl;

R^2 is hydrogen or lower alkanoyl of from 1–5 carbon atoms;

R^3 is hydrogen or methyl; and

R^4 is OR^{4a} wherein R^{4a} is alkyl of from 2–5 carbon atoms or branched alkyl of from 3–5 carbon atoms, 3,3,3-trifluoropropyl, 5- or 6-membered heterocyclic ring selected from pyridyl, furyl, or furfuryl, or phenyl in which the phenyl ring can be substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy, or trifluoromethyl;

or when R^1 and R^3 are hydrogen, R^2 and R^4 together are 1,2-ethylene or 1,3-propylene.

4,102,889

1,2,4-TRIAZOLES

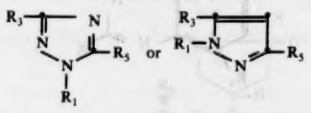
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 543,563, Jan. 23, 1975, abandoned, which is a division of Ser. No. 392,842, Aug. 29, 1973, Pat. No. 3,879,404, which is a division of Ser. No. 269,685, Jul. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,785, Sep. 25, 1970, abandoned. This application Nov. 9, 1976, Ser. No. 740,290

Int. Cl.[2] C07D *401/04*

U.S. Cl. 260—296 R **6 Claims**

1. A compound of the formula



and the amine oxides and non-toxic salts thereof, wherein

R_1 is hydrogen, lower alkyl, lower alkanoyl, benzyl, carbamoyl or di- lower alkylcarbamoyl;

R_3 is napthyl, halophenyl, dihalophenyl, aminophenyl, diloweralkylaminophenyl, loweralkanoylaminophenyl, monoloweralkoxyphenyl, or diloweralkoxyphenyl and

R_5 is pyridyl.

4,102,890

2-AMINO OXAZOLINES AND PROCESS FOR MAKING THE SAME

Charles Malen, Fresnes; Monique Desnos, Issy Les Moulineaux; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures S/Yvette, all of France, assignors to Science-Union et Cie, Societe Francaise de Recherche Medicale, Neuilly-sur-Seine, France

Division of Ser. No. 427,999, Dec. 26, 1973, Pat. No. 3,988,464. This application Aug. 11, 1976, Ser. No. 713,381

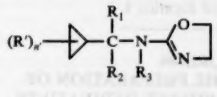
Claims priority, application France, Dec. 28, 1972, 72 59886

Int. Cl.[2] C07D *263/28*

U.S. Cl. 260—307 F **3 Claims**

1. A compound selected from the group consisting of:

a. cyclopropylmethylamines of the formula



wherein each of

R_1 and R_2 independently represents a hydrogen atom, a lower-alkyl radical, a cyclopropyl radical, or an alkyl cyclopropyl radical;

R′ represents a hydrogen atom or a lower-alkyl radical;

R_3 represents a hydrogen atom or a lower-alkyl radical;

n′ represents 0, 1, or 2; **and**

b. physiologically acceptable acid addition salts thereof with a mineral or organic acid.

4,102,891

1-(2-HALOGENO-2-PHENYL-ETHYL)-TRIAZOLES

Helmut Timmler; Karl Heinz Büchel, both of Wuppertal; Wilsen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

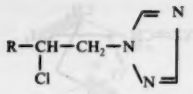
Filed Oct. 6, 1976, Ser. No. 729,930

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547954

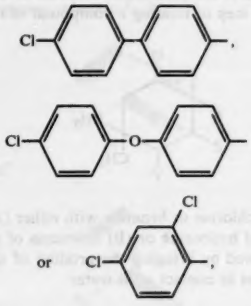
Int. Cl.[2] A01N *9/22*; A61K *31/41*; C07D *249/08*

U.S. Cl. 260—308 R **4 Claims**

1. A compound of the formula



in which R is



or a salt thereof with a physiologically tolerated acid.

4,102,892

PROCESS FOR THE PREPARATION OF COPPER PHTHYLOCYANINE

Heinz-Ewald Baurecht, and Reinhold Hörnle, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 16, 1977, Ser. No. 778,117

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611545

Int. Cl.[2] C09B *47/06*

U.S. Cl. 260—314.5 **4 Claims**

1. In the process for the preparation of copper phthalocyanine from (a) phthalic anhydride, its reaction products with ammonia or the dehydration products thereof, (b) urea, (c) a copper salt and (d) a catalyst by the baking process; the improvement which comprises feeding components (a) and (b) separately in liquid form to the reaction vessel.

4,102,893

PROCESS FOR THE MANUFACTURE OF COLOR FORMERS OF INDOLES AND ANHYDRIDES OF AROMATIC OR HETEROAROMATIC, VICINAL DICARBOXYLIC ACIDS, NEW COLOR FORMERS OF THESE CLASSES OF SUBSTANCE AND THEIR USE

Robert Garner, Ramsbottom Bury, England, and Max Dunnenberger, Frenkendorf, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

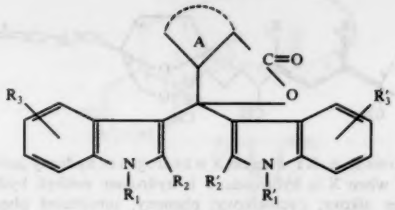
Continuation of Ser. No. 558,598, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 306,670, Nov. 15, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,012

Claims priority, application Switzerland, Nov. 26, 1971, 17239/71; Oct. 12, 1972, 14961/72

Int. Cl.[2] C07D *209/20*

U.S. Cl. 260—326.14 R **8 Claims**

1. A compound of the formula



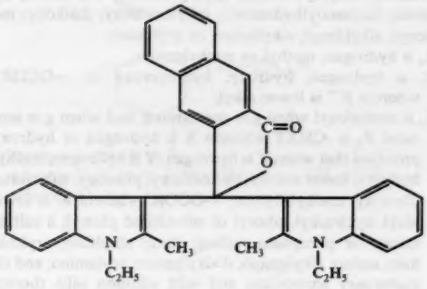
wherein the ring A is benzene or benzene substituted with halogen or nitro,

R_2 and R_2' each independently represent hydrogen, lower alkyl, or phenyl,

R_3 and R_3' each independently represent hydrogen, lower alkyl or lower alkoxy, and

R_1 and R_1' each independently represent alkyl of 6 to 18 carbon atoms.

8. A compound of the formula:



4,102,894

15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

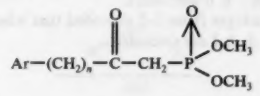
Hans-Jürgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 633,374, Nov. 19, 1975, Pat. No. 3,980,642, which is a division of Ser. No. 485,596, Jul. 3, 1974, Pat. No. 3,956,284, which is a continuation-in-part of Ser. No. 425,517, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,220, Jul. 13, 1972, abandoned. This application Jul. 15, 1976, Ser. No. 705,768

Int. Cl.[2] C07D *333/22;* A01N *9/36;* C07F *9/40*

U.S. Cl. 260—332.3 R **4 Claims**

1. A compound of the structure:



wherein Ar is α- or β-thienyl;
and *n* is an integer from 1 to 5.

4,102,895

OXEPANES

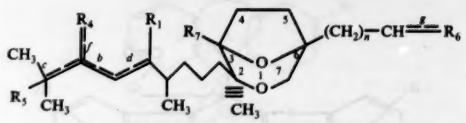
Ramesh M. Kanojia, Somerville; Michael P. Wachter, Bloomsbury, and Robert H. K. Chen, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 18, 1976, Ser. No. 742,940

Int. Cl.[2] C07D *319/10*

U.S. Cl. 260—340.6 **25 Claims**

1. A compound selected from the group consisting of:



wherein R_1 is -XY wherein X is hydrogen or hydroxy provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy; trialkylsilyloxy; -OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl, and substituted phenyl; a sulfate, nitrate or phosphate radical; thiol; alkylthio; arylthio; halo; amino; alkylamino; dialkylamino; arylamino; and the quaternary ammonium and acid addition salts thereof; acylamino; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl; substituted benzyl; phenyl; substituted phenyl; provided that when d is unsaturated R_1 is either X or V; and R_1 is oxo; thioxo; hydroxyimino; alkoxyimino; aryloxyimino; acyloxyimino; hydrazono; alkylhydrazono; arylhydrazono; arylsulfonylhydrazono; carbamoylhydrazono; ethylenedioxy; dialkoxy; methylenyl; alkyldenyl; alkylimino; or arylimino;

R_4 is hydrogen; methyl or methylenyl;

R_5 is hydrogen; hydroxy; hydroperoxy or —OCOR‴ wherein R‴ is lower alkyl;

R_6 is methylenyl when g is unsaturated, and when g is saturated R_6 is -CHXY wherein X is hydrogen or hydroxy, provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy: trialkylsilyloxy; —OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl or substituted phenyl; a sulfate, nitrate or phosphate radical; thiol; alkylthio; arylthio; halo; amino; alkylamino; dialkylamino; arylamino; and the quaternary ammonium and acid addition salts thereof; acylamino; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl; substituted benzyl; phenyl; substituted phenyl; and R_6 is —CHZ wherein Z is oxo; thioxo; hydroxyimino; alkoxyimino; aryloxyimino; acyloxyimino; hydrazono; alkylhydrazono; arylhydrazono; arylsulfonylhydrazono; carbamoylhydrazono; ethylenedioxy; dialkoxy; methylenyl; alkylidenyl; alkylimino; or arylimino; or R_6 is carboxy; —COOR′ wherein R′ is lower alkyl or cycloalkyl; phenyl or substituted phenyl; —COR″ wherein R″ is amino, alkylamino, dialkylamino, arylamino, halo, hydrazino, alkylhydrazino, dialkylhydrazino, arylhydrazino, arylsulfonylhydrazino; cyano; and ammonium, alkali metal and alkaline earth metal salts thereof where R_6 is carboxy;

R_7 is hydrogen; hydroxy; lower alkoxy; or —OCOR‴ wherein R‴ is lower alkyl;

and *n* is an integer from 0–5 provided that when b is unsaturated, C, d, & f are saturated.

4,102,896

PREPARATION OF A 5-(2,2-DIHALOVINYL)-4,4-DIMETHYL-2-OXOTETRAHYDROFURAN

Ralph Alexander Raphael, Cambridge, England, assignor to Imperial Chemical Industries Limited, London, England

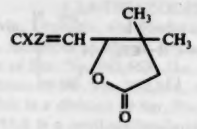
Filed May 25, 1976, Ser. No. 689,934

Claims priority, application United Kingdom, May 27, 1975, 23153/75

Int. Cl.² C07D *307/32*

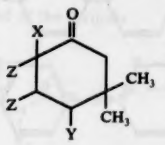
U.S. Cl. 260—343.6 **8 Claims**

1. A process for the preparation of a compound of formula:



(I)

wherein X and Z are each either chlorine or bromine, which comprises the step of treating a compound of formula:



(II)

wherein Y is chlorine or bromine with either (A) an excess of an alkali metal hydroxide or (B) an excess of an alkali metal hydride followed by bringing the product of alkali metal hydride treatment in contact with water.

4,102,897

DIALKYLACETAL-CONTAINING THROMBOXANE B, 1,9-LACTONE INTERMEDIATES

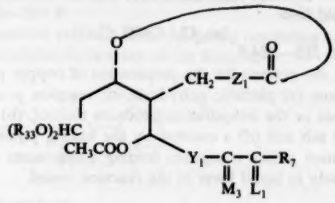
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 716,473, Aug. 20, 1976, Pat. No. 4,070,384, which is a continuation-in-part of Ser. No. 676,894, Apr. 14, 1976, Pat. No. 4,018,804. This application Sep. 6, 1977, Ser. No. 830,538

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **2 Claims**

1. A thromboxane intermediate of the formula:



wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

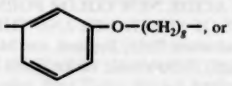
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

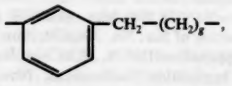
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,

(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,

(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,



(7)

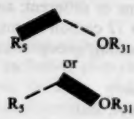


(8)

wherein *g* is one, 2, or 3;

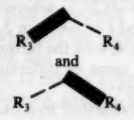
wherein Y_1 is trans-CH=CH- or -CH_2-CH_2-;

wherein M_3 is



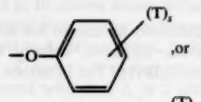
wherein R_5 is hydrogen or methyl and R_{31} is a hydroxyhydrogen replacing group; wherein L_1 is

or a mixture of



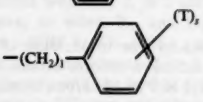
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and wherein R_7 is

(1) $-(CH_2)_m-CH_3$,



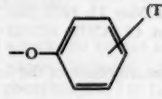
(2)

,or



(3)

wherein l is zero, one, two, or three, where m is one to 5, inclusive, T is alkyl of one to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is one, two, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_{33} is alkyl of one to 5 carbon atoms inclusive.

4,102,898

ALDEHYDE-CONTAINING THROMBOXANE B, 1,9-LACTONE INTERMEDIATES

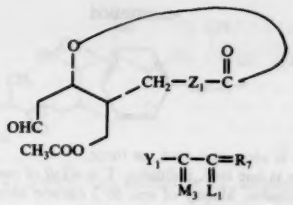
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 716,473, Aug. 20, 1976, Pat. No. 4,070,384, which is a continuation-in-part of Ser. No. 676,894, Apr. 14, 1976, Pat. No. 4,018,804. This application Sep. 6, 1977, Ser. No. 830,539

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **2 Claims**

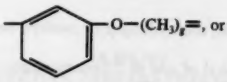
1. A thromoboxane intermediate of the formula:



wherein Z_1 is

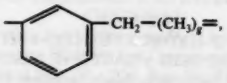
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH —CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(7)

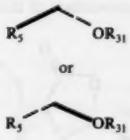


, or

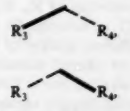
(8)



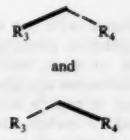
wherein g is one, 2, or 3;
wherein Y_1 is trans—CH=CH— or —CH_2—CH_2—;
wherein M_3 is



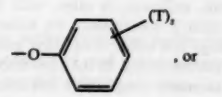
wherein R_5 is hydrogen or methyl and R_{31} is a hydroxyhydrogen replacing group;
wherein L_1 is



or a mixture of



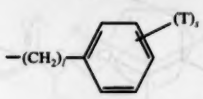
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and
wherein R_7 is



(2)

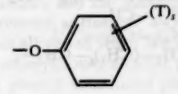
, or

-continued



(3)

wherein 1 is zero, one, two, or three,
wherein *m* is one to 5, inclusive, T is alkyl of one to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is one, two, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

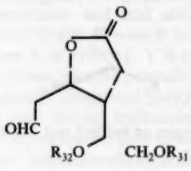
4,102,899

3-(1'-SILYLOXY-2'-HYDROXYETHYL)-4-HYDROXY-6-OXOHEXANOIC ACID γ LACTONE DERIVATIVES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,089
Int. Cl.[2] C07D *307/20*
U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_{32} is $—Si(G_1)_3$, wherein G_1 is alkyl of one to four carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one or two fluoro, chloro, or alkyl of one to four carbon atoms, inclusive, with the proviso that the various G_1's are the same or different;
wherein R_9 is an acyl protecting group selected from the group consisting of
(a) benzoyl;
(b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different;
(c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;
(d) naphthoyl;
(e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
(f) alkanoyl of 2 to 12 carbon atoms, inclusive;
wherein R_{10} is a blocking group selected from the group consisting of
(a) tetrahydropyranyl;
(b) tetrahydrofuranyl; and
(c) a group of the formula

$$—C(OR_{11})(R_{12})—CH(R_{13})(R_{14}),$$

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $—(CH_2)_a—$ or $—(CH_2)_b—O—(CH_2)_c$, wherein *a* is 3, 4, or 5, and *b* is one, 2, or 3, and *c* is one, 2, or 3, with the proviso that *b* plus *c* is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;
wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
(a) benzyl,
(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
(c) benzhydryl,
(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
(e) trityl, and
(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

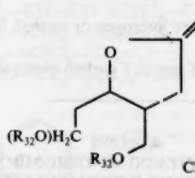
4,102,900

3-(1'-SILYLOXY-3'-HYDROXYETHYL)-4-HYDROXY-6-SILYLOXYHEXANOIC ACID γ LACTONE DERIVATIVES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,096
Int. Cl.[2] C07D *307/20*
U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_{32} is $-Si(G_1)_3$, wherein G_1 is alkyl of one to four carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one or two fluoro, chloro, or alkyl of one to four carbon atoms, inclusive, with the proviso that the various G_1's are the same or different;

wherein R_9 is an acyl protecting group selected from the group consisting of

(a) benzoyl;

(b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different;

(c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;

(d) naphthoyl;

(e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and

(f) alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of

(a) tetrahydropyranyl;

(b) tetrahydrofuranyl; and

a group of the formula

$-C(OR_{11})(R_{12})-CH(R_{13})(R_{14})$,

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c$, wherein a is 3,4, or 5, and b is one, 2, or 3, and c is one, 2, or 3, with the proviso that b plus c is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl; wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,102,901

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John Peter Clayton, Horsham, and Norman Harold Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

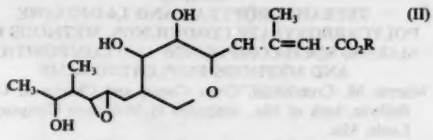
Filed Jun. 6, 1977, Ser. No. 803,466

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.[2] C07D *309/06;* **A61K** *31/35*

U.S. Cl. 260—345.8 R **6 Claims**

1. A compound of formula (II):



(II)

wherein R is C_{1-20} alkyl, C_{2-8} alkenyl or C_{2-8} alkynyl.

4,102,902

STEREOSELECTIVE PREPARATION OF HEXAHYDRO DIBENZOPYRANONES AND INTERMEDIATES THEREFOR

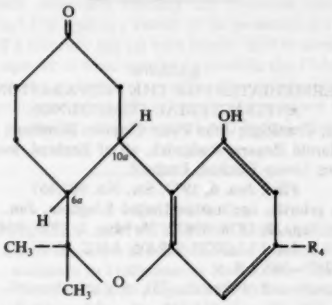
Robert A. Archer, and William A. Day, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 10, 1976, Ser. No. 740,502

Int. Cl.[2] C07D *311/80*

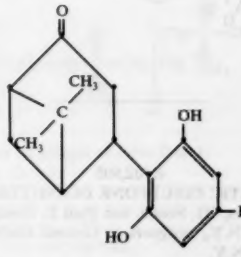
U.S. Cl. 260—345.3 **6 Claims**

1. A process for preparing an optically active 6a,10a-cis compound of the formula



wherein:

R_4 is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl and C_5–C_{10} cycloalkenyl; comprising reacting a compound of the formula



with a protonic acid selcted from hydrochloric acid, sulfuric acid, phosphoric acid, and para-toluenesulfonic acid in an unreactive organic solvent.

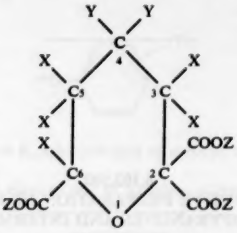
4,102,903

TETRAHYDROPYRAN AND 1,4-DIOXANE POLYCARBOXYLATE COMPOUNDS, METHODS FOR MAKING SUCH COMPOUNDS AND COMPOSITIONS AND METHODS EMPLOYING SAME

Marvin M. Crutchfield, Creve Coeur, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1977, Ser. No. 756,947
Int. Cl.[2] C07D *309/06;* C11D *3/20*
U.S. Cl. 260—345.7 R **8 Claims**

1. A compound of the molecular structure represented by the formula:



wherein Y is H or lower alkyl (C_1 to C_4), X is selected from the group consisting of H, lower alkyl ($C_1$to C_4), or COOZ, Z is selected from the group consisting of hydrogen, alkali metal, ammonium, and an alkyl group (branched or straight chain) having up to about 20 carbon atoms in the chain.

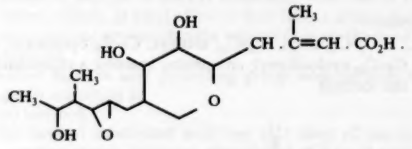
4,102,904

INTERMEDIATES FOR THE PREPARATION OF ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John Peter Clayton, Horsham, and Norman Harold Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

Filed Jun. 6, 1977, Ser. No. 803,467
Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77
Int. Cl.[2] C07D *309/06;* A61K *31/35*
U.S. Cl. 260—345.7 R **3 Claims**

1. A compound of formula (II), or a salt thereof:



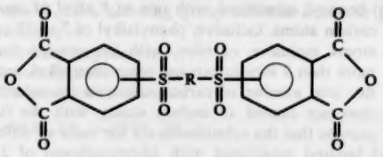
4,102,905

AROMATIC DISULFONE DIANHYDRIDES

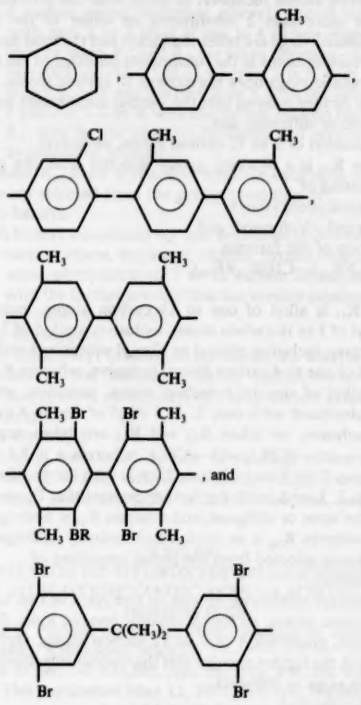
Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,113
Int. Cl.[2] C07D *307/89*
U.S. Cl. 260—346.3 **4 Claims**

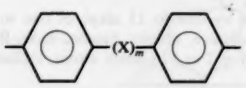
1. A disulfone dianhydride having the general formula



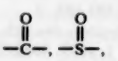
where R is a radical selected from the class consisting of



and divalent organic radicals of the general formula



where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,



—O—, and —S—, where *m* is 0 or 1, *y* is a whole number from 1 to 5.

4,102,906
PROCESS FOR PREPARING α-AMINO-β′-NITROANTHRAQUINONES

Wolfgang Auge, Odenthal-Hahnenberg; Karl-Werner Thiem, Cologne, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 485,284, Jul. 2, 1974, abandoned. This application May 7, 1976, Ser. No. 684,412

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1973, 2334991

Int. Cl.[2] C07C *97/24*

U.S. Cl. 260—382 11 Claims

1. Process for preparing an α-amino-β′-nitroanthraquinone which comprises reacting an α,β′-dinitroanthraquinone with ammonia in an ether, an aliphatic, a cycloaliphatic or an optionally alkyl-substituted aromatic hydrocarbon, or a mixture of these.

4,102,907
DESULFINYLATION PROCESS FOR PREPARING ANDROSTA-4,9(11)-DIENE-3,17-DIONE

Kenneth P. Shephard, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

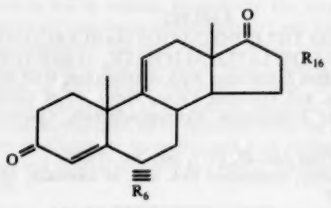
Filed Mar. 7, 1977, Ser. No. 775,128

Int. Cl.[2] C07J *5/00*

U.S. Cl. 260—397.3 25 Claims

1. A chemical process for the preparation of a steroid of the formula:

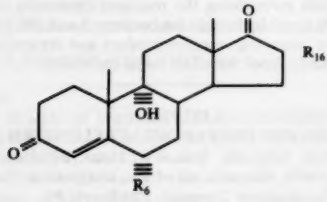
III



where R_6 is a hydrogen or fluorine atom or methyl group; R_{16} is a hydrogen atom or methyl group and where ~ indicates the attachment of the R_{16} group is in the α or β configuration which comprises

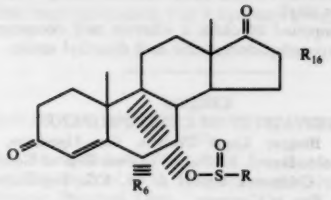
(1) sulfinylating a 9α-hydroxy steroid of the formula:

I



where R_6, R_{16}, and ~ are defined above with a sulfinylating agent of the formula R—SO—X where R is alkyl of 1 through 4 carbon atoms, or phenyl substituted with 0–3 substituents which may be the same or different and are selected from the group consisting of halogen atoms, or methyl, ethyl or nitro groups and where X is a chlorine or bromine atom to form a sulfinate ester of the formula:

II



and

(2) desulfinylating the sulfinate ester (II) by heating to at least 40° in the presence of a support catalyst selected from the group consisting of silica gel or alumina and an acid whose pKa is less than or equal to 5.0.

4,102,908
PROCESS FOR THE PREPARATION OF PREGNANE DERIVATIVES

Helmut Hofmeister; Klaus Annen; Henry Laurent, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,329

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2625306

Int. Cl.[2] C07J *5/00*

U.S. Cl. 260—397.4 8 Claims

1. In a process for the conversion of a 17α-ethynyl-17β-hydroxy steroid to a 17-methyl or ethyl ether or a 17-formyl or acetyl ester of a 17α-hydroxy-17β-acetyl steroid, the improvement which comprises reacting the 17-nitrate ester of the 17α-ethynyl-17β-hydroxy steroid in the presence of a catalytic amount of a mercury salt (a) with formic acid or acetic acid in a dipolar aprotic or basic solvent to produce the 17-formate or 17-acetate ester, respectively, or (b) with methanol or ethanol in a protonic water-miscible solvent in the presence of a mineral acid to produce the 17-methyl or 17-ethyl ether, respectively.

4,102,909
OPTICALLY ACTIVE ESTERS AND AMIDES

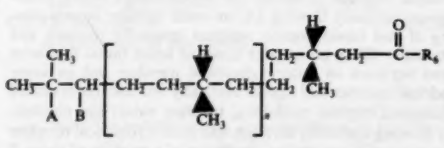
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,401, Sep. 15, 1976, Pat. No. 4,045,475, which is a division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application May 16, 1977, Ser. No. 796,922

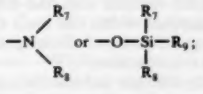
Int. Cl.[2] C09F *5/00*

U.S. Cl. 260—404 3 Claims

1. A compound of the formula:



wherein *n* is an integer of from 0 to 1;
R_6 is lower alkoxy,



n is an integer of from 0 to 1; A and B are hydrogen or taken

together form a carbon to carbon bond; and R_7, R_8 and R_9 are lower alkyl.

2. The compound of claim 1 wherein said compound is 3(R),7(R),11-trimethyl-dodecanoic acid dimethyl amide.

4,102,910

DERIVATIVES OF CYCLOPROPANE

Walter Ost, Bingen; Klaus Thomas, Gau-Algesheim, and Ricarda Prokic-Immel, Mainz, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG., Ingelheim am Rhein, Fed. Rep. of Germany

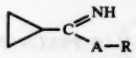
Filed Jun. 20, 1977, Ser. No. 808,435

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627779

Int. Cl.[2] C07C *119/18, 123/00*

U.S. Cl. 260—453 RW **4 Claims**

1. A compound of the formula



wherein

A is oxygen or —NH—, and

R is alkyl of 3 to 22 carbon atoms when A is oxygen, or alkyl of 2 to 22 carbon atoms when A is —NH—, or alkenyl of 3 to 18 carbon atoms,

or an acid addition salt thereof.

4,102,911

SULFONATING OR SULFATING METHOD

Kanji Majima; Kensuke Takei, and Keiichi Tsutoo, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 739,010, Jun. 21, 1968, abandoned. This application Apr. 13, 1972, Ser. No. 243,874

Claims priority, application Japan, Jun. 26, 1967, 42-40928

Int. Cl.[2] C07C *139/04*

U.S. Cl. 260—458 R **6 Claims**

1. In a continuous gas-liquid reaction process for sulfating or sulfonating liquid organic reactant capable of being sulfated or sulfonated by reaction with gaseous sulfur trioxide and being selected from the group consisting of (1) straight chain or branched chain alcohol having 8 to 20 carbon atoms or mixtures thereof, (2) alkyl benzene whose alkyl chain has from 8 to 25 carbon atoms or mixtures thereof, (3) straight or branched chain olefin having 6 to 25 carbon atoms or mixtures thereof, (4) addition product of an alcohol, phenol or fatty acid having 8 to 20 carbon atoms and 1 to 30 mols of alkylene oxide, (5) fatty acid alkylolamide having 10 to 20 carbon atoms, (6) fatty acid having 8 to 20 carbon atoms, esters thereof with a lower alcohol or mixtures thereof, and (7) polyhydric alcohol ester of a fatty acid having 8 to 20 carbon atoms or its alkylene oxide derivatives, wherein said organic reactant is reacted with gaseous sulfur trioxide to obtain a corresponding sulfated or sulfonated reaction product, the improvement which comprises continuously flowing (A) an outer annular stream consisting of said liquid organic reactant upwardly through and substantially filling an annular space of small radial thickness defined between an outer cylindrical member and an inner cylindrical member and thence vertically into the lower end of an elongated vertical cylindrical reaction zone , and continuously flowing upwardly through said inner cylindrical member (B) an inner gaseous stream consisting of a mixture of about 2 to 20% by volume of sulfur trioxide and the balance a gaseous inert diluent, said streams flowing in concurrent substantially parallel vertically upwardly directed flow into and through said elongated vertical cylindrical reaction zone, the entirety of said gaseous stream being disposed within said inner cylinder and isolated from said organic reactant stream prior to entry of said streams into said reaction zone;

said streams flowing upwardly through said reaction zone in gas-liquid contact, said stream of liquid reactant forming a continuous thin annular upwardly rising outer liquid film of substantially uniform thickness on the wall of said reaction zone and extending the entire length thereof, said gaseous stream flowing inside of said liquid film upwardly through the entire length of the reaction zone and having a flow velocity in the range of from about 20 m./sec. to about 130 m./sec., said gaseous stream uniformly contacting said annular liquid film over its entire inner surface in said reaction zone to effect upward movement and mixing of said liquid film whereby the organic reactant and the gaseous sulfur trioxide are mixed and contacted with each other to effect the reaction, and rapidly extracting heat from the resultant reaction mixture as it passes upwardly through the reaction zone;

separating the liquid phase from the gaseous phase after same have left the top of the reaction zone and recovering the reaction product from the liquid phase.

4,102,912

PROCESS TO PREPARE POLYHALODIPHENYL CARBONATES

Dennis James Carr, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 14, 1977, Ser. No. 768,179

Int. Cl.[2] C07C *68/02*

U.S. Cl. 260—463 **5 Claims**

1. In a method of preparing a polyhalodiphenyl carbonate containing 6 to 10 halogen atoms by reacting a polyhalophenol and a carbonate precursor in the presence of a catalyst in a basic aqueous medium, the improvement comprising carrying out the reaction in a continuous, single stage at a pH in the range of about 10.5 to 11.5 and in the presence of a chlorinated hydrocarbon solvent in which the polyhalodiphenyl carbonate is essentially insoluble and in which color bodies associated with the polyhalophenol starting material are soluble and retained.

4,102,913

PROCESS FOR THE CONTINUOUS MANUFACTURE OF α-CYANO-ETHYLATED ALIPHATIC ALDEHYDES

Boy Cornils; Hans Feichtinger, both of Dinslaken; Willi Nöllen, Oberhausen, and Wolfgang Payer, Wesel, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Apr. 25, 1977, Ser. No. 790,202

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619580

Int. Cl.[2] C07C *120/00, 121/20, 121/34*

U.S. Cl. 260—465.1 **10 Claims**

1. In the α-cyanoethylation of an aliphatic aldehyde by contacting acrylonitrile with an aliphatic aldehyde capable of cyanoethylation in the presence of an alkali metal hydroxide, the improvement which comprises carrying out the process continuously in a tubular reaction zone at a temperature of 20° to 120° C while maintaining the reactants therein in contact with the alkali metal hydroxide for between 5 and 200 seconds and thereafter removing reaction product and separating the same immediately from the alkali metal hydroxide.

4,102,914

PROCESS FOR PREPARING ACRYLONITRILE

Harold Beuther, Gibsonia; Robert A. Innes, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 20, 1977, Ser. No. 798,755

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465.3 **17 Claims**

1. A process for preparing acrylonitrile which comprises passing a gaseous mixture comprising propylene, ammonia and molecular oxygen and a solid ammoxidation catalyst, said catalyst being a catalyst capable of producing acrylonitrile at a rate of at least about 0.1 gram of acrylonitrile per gram of

catalyste per hour, through a reaction zone at an elevated temperature while maintaining a solids density of about 16 to about 240 kilograms per cubic meter and a superficial linear gas velocity of about 1.5 to about 7.5 meters per second wherein the resulting mixture of gases and solids is removed from the reaction zone and is introduced into a separator within a time interval of less than about 1 second.

4,102,915
DIMERIZATION PROCESS

James Robert Jennings, and Philip John Hogan, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

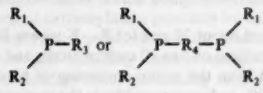
Filed May 3, 1977, Ser. No. 793,272

Claims priority, application United Kingdom, May 10, 1976, 19108/76

Int. Cl.[2] **C07C** *120/00, 121/30*

U.S. Cl. 260—465.8 D **9 Claims**

1. In a process for the dimerisation of acrylonitrile to predominantly 1,4-dicyanabutene straight-chain C_6 dimers, in which an organic phosphorus compound of the formula:



where R_1 is a hydrocarbyl group, R_2 is an alkoxy or cycloalkoxy group, R_3 is a hydrocarbyl, alkoxy or cycloalkoxy group and R_4 is a divalent hydrocarbyl or hydrocarbyloxy group, is brought into contact with acrylonitrile dissolved in an organic solvent capable of donating protons and substantially unreactive with respect to acrylonitrile and the dimeric reaction products, optionally with a non-hydroxylic co-solvent, at a temperature from 0° to 120° C, the concentrations of acrylonitrile and phosphorus compound being in the range 5 to 75% and 0.01 to 5% by volume, respectively, the acrylonitrile and solvent or solvents being substantially dry and free from acrylonitrile stabilizers, the improvement which comprises selecting one or both of said solvents to have a boiling point higher than that of acrylonitrile and being capable of rapid phase separation with respect to the dimeric products, to enable the unreacted acrylonitrile to be removed from the reacted mixture by distillation to leave the said high boiling solvent or solvents and dimeric products as a readily separable two-phase mixture.

4,102,916
PERFLUOROALKYLTHIOAMINIMIDE DERIVATIVES

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 2, 1976, Ser. No. 747,112

Int. Cl.[2] **C07C** *143/155, 143/08*

U.S. Cl. 260—501.12 **8 Claims**

1. A perfluoroalkylthioaminimide of the formula

$$R_fR_1SCH_2CH(R_2)\ CON^-N^+(R_3)(R_4)\ R_5$$

wherein

R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 atoms;

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms;

R_2 is hydrogen or straight or branched chain alkyl of 1 to 6 carbon atoms;

R_3 and R_4 each is independently straight or branched chain alkyl of 1 to 22 carbon atoms and

R_5 is straight or branched chain alkyl of 1 to 22 carbon atoms that may also contain 1 or 2 hydroxyl groups.

4,102,917
SUBSTITUTED PHENYL NAPHTHALENESULFONIC ACIDS

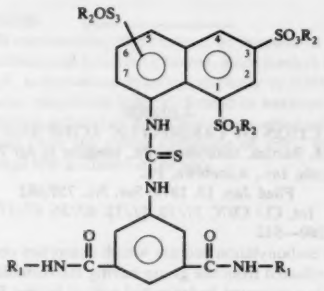
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,340

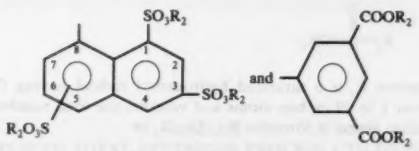
Int. Cl.[2] **C07C** *143/36;* **A61K** *31/185*

U.S. Cl. 260—506 **4 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of



wherein R_2 is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

4,102,918
ANIONIC PHENYLCARBOXAMIDE COMPLEMENT INHIBITORS

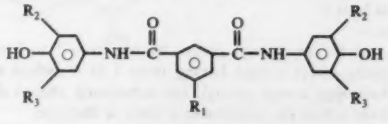
Gerald Joseph Sluta, Yonkers, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,339

Int. Cl.[2] **C07C** *143/44, 101/74, 65/14;* **A61K** *31/19*

U.S. Cl. 260—507 R **5 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of nitro and amino; R_2 is selected from the group consisting of hydrogen and carboxy; R_3 is selected from the group consisting of carboxy and $—SO_3X$, wherein X is selected from the group consisting of alkalimetal; with the proviso that when R_3 is carboxy, then R_2 must be hydrogen; and the pharmaceutically acceptable salts thereof.

4,102,919

ISOMERIC DICARBOXY, DI (HYDROXYMETHYL), DIPHENYLMETHANES AS NEW COMPOUNDS

Anatoli Onopchenko, Monroeville; Johann G. Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 8, 1976, Ser. No. 748,687
Int. Cl.[2] C07C 65/14
U.S. Cl. 260—520 E 4 Claims

1. Diphenylmethanes selected from the group consisting of 3,3'-dicarboxy, 4,4'-di(hydroxymethyl), diphenylmethane, 4,4'-dicarboxy, 3,3'-di(hydroxymethyl), diphenylmethane and 4,3'-dicarboxy, 3,4'-di(hydroxymethyl) diphenylmethane.

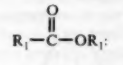
4,102,920

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

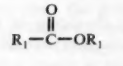
Charles M. Bartish, Bethlehem, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jan. 13, 1977, Ser. No. 759,082
Int. Cl.[2] C07C 51/10, 51/12, 67/36, 67/37
U.S. Cl. 260—532 10 Claims

1. In a carbonylation process which comprises contacting a reactant selected from the group having the formula (a) ROH where R is a saturated hydrocarbyl radical having from about 1 to 20 carbon atoms, (b) $R_1—O—R_1$ or

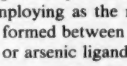


wherein R_1 is a saturated hydrocarbyl radical having from about 1 to 19 carbon atoms and wherein the total number of carbon atoms in formulas $R_1—O—R_1$ or



does not exceed about 20 and (c) R—X where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen atom selected from the group consisting of bromine, chlorine and iodine, with carbon monoxide, in the presence of a catalyst consisting essentially of (1) a rhodium compound and (2) a halogen component, the improvement which comprises

employing as the rhodium compound a rhodium complex formed between a rhodium component and a phosphorus or arsenic ligand of the formula:



in which the molar ratio of chelating ligand to rhodium is at least 1

wherein:

R_1 and R_3 are alkenyl groups having from 1 to 6 carbon atoms, alkyl groups having from 1 to 6 carbon atoms, hydrogen atoms, phenyl, and substituted phenyl derivatives where the substituent is nitro or fluorine;

R_2 and R_4 are phenyl and substituted phenyl groups where the substituent is nitro or fluorine;

P_1 and P_2 are phosphorus or arsenic;

A is an aryl group, an alkenyl group having from 2 to 4 carbon atoms and $(CH_2)_n$ where n is from 1–3 when P_1 and P_2 are phosphorus and 2–4 when P_1 or P_2 is arsenic and carrying out said process at a temperature of from about 160° to about 250° C.

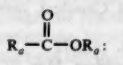
4,102,921

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

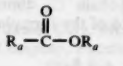
Charles M. Bartish, Bethlehem, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Apr. 26, 1977, Ser. No. 791,121
Int. Cl.[2] C07C 51/10, 51/12, 67/36, 67/37
U.S. Cl. 260—532 12 Claims

1. In a carbonylation process which comprises contacting a reactant selected from the group having the formula (a) ROH where R is a saturated hydrocarbyl radical having from about 1 to 20 carbon atoms, (b) $R_a—O—R_a$ or

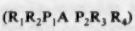


wherein R_a is a saturated hydrocarbyl radical having from about 1 to 19 carbon atoms and wherein the total number of carbon atoms in formulas $R_a—O—R_a$ or



does not exceed about 20 and (c) R—X where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen atom selected from the group consisting of bromine, chlorine and iodine, with carbon monoxide, in the presence of a catalyst consisting essentially of (1) an iridium compound and (2) a halogen component, the improvement which comprises

employing as the iridium compound an iridium complex formed between an iridium compound and a phosphorus or arsenic ligand of the formula:



in which the molar ratio of chelating ligand to iridium is at least 1

wherein:

R_1 and R_3 are alkenyl groups having from 2 to 6 carbon atoms, alkyl groups having from 1 to 6 carbon atoms, hydrogen atoms, phenyl groups, and substituted phenyl, said substituents selected from the group consisting of nitro and fluorine groups;

R_2 and R_4 are phenyl groups and substituted phenyl groups, said substituents selected from the group consisting of nitro and fluorine groups;

P_1 and P_2 are phosphorus or arsenic;

A is a phenylene group, an alkenyl group having from 2 to 4 carbon atoms and $(CH_2)_n$ where n is from 1–4; and

carrying out said process at a temperature of from about 160° C to about 250° C.

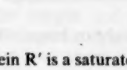
4,102,922

PURIFICATION OF CARBONYLATION PRODUCTS

Jerry L. Price, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

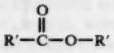
Continuation of Ser. No. 537,500, Dec. 30, 1974, abandoned.
This application Oct. 12, 1976, Ser. No. 731,594
Int. Cl.[2] C07C 51/10, 51/12, 51/44, 67/36
U.S. Cl. 260—532 7 Claims

1. In a carbonylation process for the production of carboxylic acids wherein a compound selected from the group consisting of compounds having the formulas: ROH wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms, R'—O—R' wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20,



wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon

atoms and wherein the total number of carbon atoms in the compound does not exceed 20, and R—X wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine, is reacted with carbon monoxide or with carbon monoxide and water when said compound has the formula R′—O—R′,



or R—X in the liquid phase in a reaction zone in the presence of a catalytic system which contains a rhodium or iridium component and an iodine or bromine component, and wherein a portion of the liquid reaction mass is passed to a separation zone without the addition of heat, said separation zone having a pressure of at least 20 psi less than the pressure in said reaction zone, to vaporize at least a portion of the carbonylation products, the remaining liquid reaction mass is recycled to the reaction zone and the vaporized carbonylation products are withdrawn and subjected to distillation for purification thereof, the improvement which comprises removing alkanes from the vaporized carbonylation products by introducing said vaporized carbonylation products into the lower half of a first distillation zone and distilling therein under conditions to provide an overhead product containing substantially all the alkanes introduced into said zone, and a bottoms product, removing said overhead product, condensing it, and separating it into a light phase and a heavy phase containing substantially all of said alkanes, withdrawing a slipstream constituting from about 0.1 to about 1% by weight of said heavy phase, introducing said slipstream into the upper section of a second distillation zone while introducing a stripping gas into the lower part of said second distillation zone and distilling therein to provide an overhead stream substantially free of alkanes and a bottoms stream consisting substantially of alkanes, recycling said alkane-free overhead stream from said second distillation zone to said separation zone, and removing said alkane-containing stream for disposal.

4,102,923

TRIS(UREIDOMETHYL)PHOSPHINE OXIDES

Armand B. Pepperman, Jr., Metairie; Donald J. Daigle, New Orleans, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 8, 1975, Ser. No. 611,460

Int. Cl.[2] C07C *127/00*

U.S. Cl. 260—553 R **6 Claims**

1. Tris(4-methylureidomethyl)phosphine oxide.

4,102,924

PROCESS FOR THE PREPARATION OF DIARYL COMPOUNDS

Walter Kalk, Opladen; Hans Samuel Bien, Burscheid, and Karl Heinz Schundehutte, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

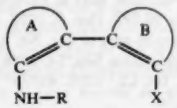
Division of Ser. No. 515,222, Oct. 16, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,314

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1973, 2353580

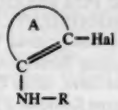
Int. Cl.[2] C07C *103/34*

U.S. Cl. 260—562 P **8 Claims**

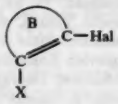
1. Process for preparing diaryl compounds of the formula



by reacting acylamino-aryl compound of the formula



with an aryl compound of the formula



wherein

X is —NHR;

A and B are benzene; naphthalene; or benzene or naphthalene substituted by chloro, bromo, nitro methyl, trifluoromethyl, acetylamino, hydroxy, methoxy or diethylamino;

R is acetyl, propionyl, butyryl, formyl or benzoyl;

the o-position relative to Hal is free of activating substituents selected from the group consisting of nitro, nitrile and carbonyl Hal is chloro or bromo.

4,102,925

STEROID TOTAL SYNTHESIS PROCESS UTILIZING ASYMMETRIC INDUCTION

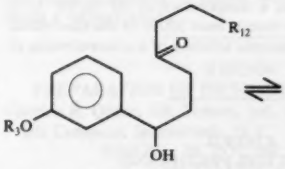
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

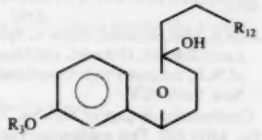
Continuation of Ser. No. 616,344, Sep. 24, 1975, abandoned, which is a division of Ser. No. 406,980, Oct. 16, 1973, Pat. No. 3,932,519, which is a division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Dec. 22, 1976, Ser. No. 753,340

Int. Cl.[2] C07C *91/18*

U.S. Cl. 260—570.6 **4 Claims**

1. A compound of the formula





wherein R_3 is a cycloalkyl group, or a primary alkyl group of from 1 to 8 carbon atoms and R_{12} is lower hydrocarbylamino or di(lower hydrocarbyl)amino.

4,102,926

METHOD FOR PRODUCING 4-NITROSODIPHENYLAMINE

Aldan Alexandrovich Usvyatsov, ulitsa Remizova, 15; Dmitry Mikhailovich Popov, ulitsa Sumskaya, 6, korpus 4, kv. 92; Alevtina Semenovna Slavnova, ulitsa Uralskaya, 6, korpus 6, kv. 64; Elena Vladimirovna Genkina, 2 Schukinsky proezd, 19, kv. 13, all of Moscow; Nikolai Mikhailovich Vdovin, ulitsa Ordzhonikidze, 5, kv. 5, Kemerovo; Mikhail Grigorievich Pleshkov, Sovetsky prospekt, 79, kv. 22, Kemerovo; Ravil Safinovich Safin, prospekt Lenina, 63, kv. 54, Kemerovo; Sergei Nikolaevich Naumov, ulitsa Vesennaya, 24, kv. 98, Kemerovo; Felix Georgievich Kokoulin, Sevastopolsky prospekt, 65/15, kv. 69, Moscow; Georgy Borisovich Manelis, ulitsa Dmitria Ulyanova, 4, korpus B, kv. 339, Moscow; Valentina Petrovna Trofilkina, ulitsa letchika Babushkina, 33, korpus 1, kv. 38, Moscow; Ljudmila Ilinichna Te, Sovetsky prospekt, 110, kv. 23, Kemerovo; Olga Nikolaevna Voronkova, Sovetsky prospekt, 87, kv. 36, Kemerovo, and Galina Alexandrovna Formenova, ulitsa Vesennaya, 22, kv. 33, Kemerovo, all of U.S.S.R.

Filed Jan. 6, 1977, Ser. No. 757,348

Int. Cl.[2] C07C *87/60*

U.S. Cl. 260—576 **9 Claims**

1. A method for producing 4-nitrosodiphenylamine, wherein diphenylamine is nitrosated with a nitrosating agent selected from the group consisting of nitrates of alkali metals and ammonium nitrite in the presence of an acid and an organic solvent immiscible with water; followed by rearrangement of the resultant N-nitrosodiphenylamine with anhydrous hydrogen chloride in an inert gas atmosphere in the presence of an alkyl 4-aminodiphenylamine in an amount of 0.5–1% of N-nitrosodiphenylamine by weight; the forming 4-nitrosodiphenylamine hydrochloride being then neutralized and the desired product isolated.

4,102,927

PROCESS FOR THE PREPARATION OF 2,4-DINITROANILINE

Gert Volkwein, Kelkheim, Taunus, and Konrad Baessler, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 10, 1976, Ser. No. 713,141

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536454

Int. Cl.[2] C07C *85/04*

U.S. Cl. 260—581 **6 Claims**

1. In a process for the preparation of 2,4-dinitroaniline by reacting 4-chloro-1,3-dinitrobenzene with aqueous ammonia at an elevated temperature and under pressure the improvement comprising introducing at a temperature of 60° to 90° C 4-chloro-1,3-dinitrobenzene into at least 300% of the theoretical amount of an aqueous ammonia solution of a concentration of 15 to 40% by weight.

4,102,928

PROCESS FOR PRODUCING SUBSTITUTED-1-ACETYL-3,3-DIMETHYLCYCLOHEXANE

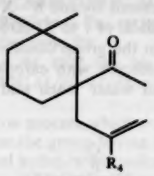
John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick Louis Schmitt, Holmdel, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,488. This application Dec. 22, 1976, Ser. No. 753,453

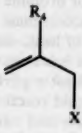
Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 C **6 Claims**

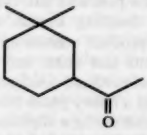
1. A process for preparing a compound having the structure:



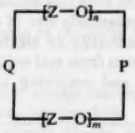
comprising the step of reacting an allylic halid having the structure:



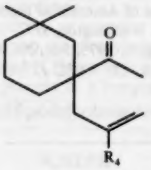
with 1-acetyl-3,3-dimethylcyclohexane having the structure:



in the presence of a crown ether having the structure:



and potassium hydroxide and toluene, and heating the resulting mixture to reflux for a period of time sufficient to cause conversion to said compound having the structure:



wherein R_4 is methyl or hydrogen; X is chloro or bromo; Z is C_1–C_4 lower alkylene; n is an integer of from 3 up to 8; p and q are the same or different and each represents C_1–C_4 lower alkylene or orthophenylene.

4,102,929

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

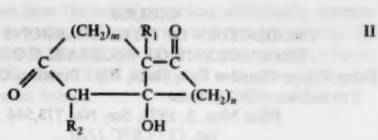
Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 14, 1976, Ser. No. 723,130

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 FA **3 Claims**

1. Compounds of the formula



II

where R_1 is lower alkyl, lower alkenyl, lower alkynyl or halogen; R_2 is phenyl, phenyl substituted with halogen, lower alkyl, lower alkoxy and nitro, benzyl, metamethoxybenzyl, phenethyl or meta-methoxyphenethyl; *n* is an integer between 1 and 5 inclusive and *m* is an integer between 1 and 4 inclusive.

4,102,930

ALDOL REACTIONS CATALYZED BY ALKYLENE OXIDE-SALT COMPLEXES

Mary Lease Deem, Bernardsville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,542
Int. Cl.[2] C07C *49/04, 49/08*
U.S. Cl. 260—593 R **16 Claims**

1. Method of condensing organic carbonyl compounds, selected from the group consisting of aliphatic aldehydes and ketones, in an aldol reaction which comprises contacting said carbonyl compounds in the absence of a solvent at a temperature of about 30° to about 125° C. with a catalytic amount of a complex of (a) an alkylene oxide having 2 or more carbon atoms and (b) a salt or a salt plus an oligomeric derivative of ethylene oxide, said salt having the formula MZ wherein M is a cation selected from the group consisting of alkali metal, substituted organic onium, ammonium, arsenonium, and phosphonium cations, where the ammonium cation has the formula:

wherein each of R_1, R_2, R_3 and R_4 is an alkyl group having 1 to about 18 carbon atoms, and wherein Z is an anion selected from the group consisting of halides, carboxylates having 1 to about 4 carbon atoms, and sulfonates.

4,102,931

MANUFACTURE OF TERTIARY MERCAPTANS USING ZEOLITE CATALYSTS

Bernard Buchholz, Whitpain, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 17, 1977, Ser. No. 797,704
Int. Cl.[2] C07C *148/00*
U.S. Cl. 260—609 B **14 Claims**

1. A method for preparing tertiary mercaptans having from 4 to 18 carbon atoms comprising reacting hydrogen sulfide with a branched, unsymmetrical olefin or oligomer thereof, said olefin having the formula $R_1R_2C{=}CR_3R_4$ where R_1 and R_2 are the same or different alkyl radicals, and R_3 and R_4 are independently either hydrogen or the same or different alkyl radicals, in the presence of a catalytic amount of a synthetic zeolite of the X or Y type having an alkali metal content, expressed as Na_2O, of less than 10 percent by weight.

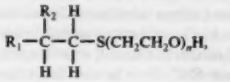
4,102,932

BETA, BETA-DIALKYLETHYLMERCAPTOETHOXYLATES AS NEW COMPOUNDS

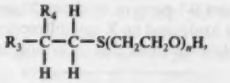
Anatoli Onopchenko, Monroeville, and Johann G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 600,150, Jul. 29, 1975, Pat. No. 4,009,211. This application Jan. 14, 1977, Ser. No. 759,420
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.
Int. Cl.[2] C07C *149/18*
U.S. Cl. 260—609 R **13 Claims**

1. Novel beta,beta-dialkylethylmercaptoethoxylates selected from the group of dialkylethylmercaptoethoxylates of the following structural formulas:



wherein R_1 and R_2, the same or different, are alkyl substituents having from one to ten carbon atoms, with the number of carbon atoms in $R_1 + R_2$ totaling 10, 14 or 16, and



wherein R_3 and R_4, the same or different, are alkyl substituents having from two to ten carbon atoms, with the total number of carbon atoms in $R_3 + R_4$ totaling 12, and *n* is an integer greater than 3.

4,102,933

PROCESS FOR PREPARING A S-TRIALKOXY BENZENE

Barrie D. Howarth, Hexthorte Doncester, England, and Ryszard J. Kobylecki, Princeton, N.J., assignors to Oce-Andeno B.V., Venlo, Netherlands

Continuation of Ser. No. 527,525, Nov. 27, 1974, abandoned. This application Jul. 23, 1976, Ser. No. 708,025
Int. Cl.[2] C07C *41/04*
U.S. Cl. 260—613 D **15 Claims**

1. A process for preparing a s-trialkoxy benzene having one or two carbon atoms in each of the alkoxy groups, which comprises reacting 1, 3, 5-tribromo benzene with an alkali metal alcoholate having one or two carbon atoms in the molecule in the presence of a copper salt catalyst and an aprotic solvent and recovering formed s-trialkoxy benzene, said catalyst being a cuprous or cupric halogenide and said solvent being a tertiary amide.

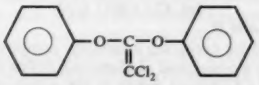
4,102,934

PREPARATION OF DICHLOROKETENE-KETALS

Clayton B. Quinn, Mt. Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,020
Int. Cl.[2] C07C *41/04*
U.S. Cl. 260—613 R **8 Claims**

1. The process for making a compound having the formula



which comprises effecting reaction between an alkali-metal phenate selected from the class consisting of potassium and

sodium phenates and tetrachloroethylene in an aprotic solvent and thereafter isolating the formed compound.

4,102,935

CATALYST AND PROCESS FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

William Joseph Kroenke, Brecksville; Richard Tobey Carroll, Cuyahoga Falls, and Angelo Joseph Magistro, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1976, Ser. No. 669,896
Int. Cl.[2] C07C *21/02*
U.S. Cl. 260—656 R **5 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising contacting ethane, oxygen, and hydrogen chloride in the presence of a solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3, said catalyst stabilized with lanthanum, a lanthanide, or mixtures thereof, at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and hydrogen chloride are employed at a mole ratio of 1 mole of ethane to 0.1 to 10 moles of hydrogen chloride to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, a total lanthanum and lanthanide content of from about 0.1 percent to about 20 percent by weight expressed as the oxide, and an X-ray diffraction pattern having peak positions different than that of its host lattice.

4,102,936

CATALYST AND PROCESS FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

Angelo Joseph Magistro, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1976, Ser. No. 669,895
Int. Cl.[2] C07C *21/02*
U.S. Cl. 260—656 R **5 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising contacting ethane, oxygen, and hydrogen chloride in the presence of a solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3, said catalyst stabilized with lanthanum, a lanthanide, or mixtures thereof, and modified with cobalt cations, at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and hydrogen chloride are employed at a mole ratio of 1 mole of ethane to 0.1 to 10 moles of hydrogen chloride to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, a total lanthanum and lanthanide content of from about 0.1 percent to about 20 percent by weight expressed as the oxide, a total modified metal cation content of from about 0.05 percent to about 3 percent by weight, and an X-ray diffraction pattern having peak positions different than that of its host lattice, all weights based upon the total weight of the catalyst.

4,102,937

CYCLOPARAFFIN ISOMERIZATION USING A CATALYTICALLY ACTIVE ALUMINUM HALIDE INTERCALATED IN GRAPHITE

Jesse R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1976, Ser. No. 747,126
Int. Cl.[2] C07C *5/28*
U.S. Cl. 260—666 P **9 Claims**

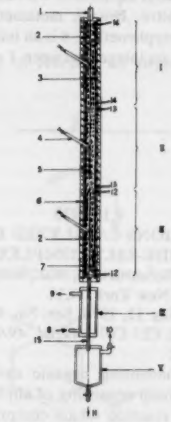
1. A method for preparing a catalytic composition comprising contacting a compound of aluminum halide intercalated in graphite with a hydrogen halide in the presence in the liquid state of an isomerizable cycloparaffin for a time and at a temperature sufficient to form a composition catalytically active for isomerization of said cycloparaffin.

4,102,938

PRODUCTION OF HYDROCARBONS BY THERMOLYSIS OF VEGETABLE OILS

Kalur Vijaya Chandra Rao, Head, PSC Division, CMG, VSSC, Trivandrum-695022, India

Filed Mar. 2, 1977, Ser. No. 773,544
Int. Cl.[2] C07C *1/20*
U.S. Cl. 260—676 R **15 Claims**



1. A process for producing hydrocarbons from vegetable oils which comprises thermolyzing the said oils in the presence of a silica-alumina catalyst impregnated with any one of the oxides of the transition metals of groups IIA, IIIB, IVB, VB, VIB, VIIB and VIII of the Periodic Table at temperatures ranging between 300° and 700° C under atmospheric pressure in a fluidized bed, moving bed or fixed bed continuous tubular reactor, separating and purifying the resulting hydrocarbons.

4,102,939

OLEFIN DISPROPORTIONATION OVER SILICA-RARE EARTH METAL OXIDE CATALYSTS

John W. Myers, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,765
Int. Cl.[2] C07C *3/62*
U.S. Cl. 260—683 D **21 Claims**

1. A process for conversion of monoolefins in accordance with the olefin reaction which comprises contacting said monoolefins under reaction conditions with an effective amount of a rare earth metal oxide catalyst supported on silica, wherein said rare earth metal oxide catalyst consists essentially of the oxides of yttrium, lanthanum, cerium, praseodymium, dysprosium, or mixture thereof, on silica.

4,102,940

WORKING UP POLYSILOXANE/POLYCARBONATE COPOLYMERS

Karl-Friedrich Thom; Günther Maass, both of Cologne, and Manfred Beck, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1976, Ser. No. 747,264
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555746
Int. Cl.[2] C08L *43/04*
U.S. Cl. 260—824 R **3 Claims**

1. In the preparation and working up of a SiOC-linked polysiloxane/polycarbonate copolymer comprising reacting an α,ω-dihydroxy-oligocarbonate in the presence of a tertiary amine and a solvent, and subsequently separating off the result-

ing copolymer from the reaction mixture additionally containing the amine, amine hydrochloride and organic solvent, the improvement which comprises subjecting the reaction mixture to steam distillation at a pH of about 7 to 8 whereby the copolymer remains behind.

4,102,941

METHOD FOR MAKING SILARYLENESILOXANE-POLYDIORGANOSILOXANE BLOCK POLYMERS

Ronald W. LaRochelle, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,779
Int. Cl.[2] C08L *83/10*
U.S. Cl. 260—825 **6 Claims**

1. A method for making silarylenesiloxane-polydiorsanosiloxane block polymer which comprises

(1) refluxing a mixture comprising a silarylene-silanediol, a silanol terminated polydiorganosiloxane, and an inert organic solvent and an effective amount of an amine-carboxylic acid catalyst,

(2) adding from 0.01% to 100% by weight of water, based on the weight of the mixture,

(3) heating the resulting mixture of (2) to effect the separation of an azeotrope of water and the substantially inert organic solvent until the mixture is substantilaly free of water,

(4) adding an amount of an organic carbonyl compound to the mixture of (3), which is effective to facilitate the removal of amine-carboxylic acid catalyst residues, and

(5) devolatilizing the mixture of (4) at a temperature of up to 175° C.

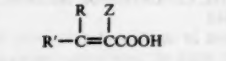
4,102,942

COMPOSITIONS OF HIGH SOLIDS CONTENT COMPRISING CARBOXYLIC POLYMER AND ALIPHATIC DIEPOXIDE

Oliver Wendell Smith, South Charleston; Robert Arthur Taller, and Joseph Victor Koleske, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,816
Int. Cl.[2] C08G *59/42;* C08L *63/10*
U.S. Cl. 260—836 **7 Claims**

1. A high solids composition comprising (I) from 10 to 60 weight percent of a low molecular weight carboxylic-containing copolymer and (II) from 40 to 90 weight percent of an aliphatic polyepoxide, said percentages based on the combined weights of (I) and (II); and wherein said low molecular weight copolymer (I) has a molecular weight of from about 500 to about 10,000 and is the copolymer of (A) a monocarboxylic acid or dicarboxylic acid of the structure:



wherein Z is hydrogen or methyl or carboxymethyl; R is hydrogen or methyl and R′ is hydrogen or carboxyl; and (B) from 30 to 80 weight percent of a polymerizable ethylenically unsaturated monomer whose polymers have a glass transition temperature below 0° C.

4,102,943

POWDER COATING RESIN PROCESS

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,733, which is a continuation-in-part of Ser. No. 317,901, Dec. 26, 1972, abandoned. This application Aug. 18, 1976, Ser. No. 715,488
Int. Cl.[2] C08L *61/32, 61/24, 67/02*
U.S. Cl. 260—850 **4 Claims**

1. A curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120 to 220° C., comprising:

(A) from about 15 to 30 parts by weight of a condensate of a methylolamino compound, an aliphatic alcohol containing from 1 to 4 carbon atoms and a reactive aromatic carboxylic acid amide of number average molecular weight less than 500; wherein the methylolamino compound is a methylolurea or methylolaminotriazine containing no more than one unmethylolated N—H bond per molecule, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolamino compound to the aromatic amide is from about 1:0.5 to about 1:2 when the aromatic amide contains one reactive group per molecule and is from about 1:0.5 to about 1:1.5 when the aromatic amide contains 2 or more reactive groups per molecule, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aromatic amide and wherein the glass transition temperature of the condensate is in the range of from −10° C. to 100° C.; and

(B) from about 85 to 70 parts by weight of a polyester resin or an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100° C., and a number average molecular weight in the range of 500 to 25,000, and contains alcoholic hydroxyl groups, carboxyl groups or amide groups, heat reactive with the condensate of the methylolamino compound, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 percent by weight of hydroxyl, carboxyl, or amide groups.

4,102,944

LOW PROFILE UNSATURATED POLYESTER RESIN COMPOSITION

Yoshiya Fukuyama, Hirakata; Katsuo Akagane, and Takao Miwa, both of Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 16, 1976, Ser. No. 723,934
Claims priority, application Japan, Sep. 25, 1975, 50/116070
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—861 **13 Claims**

1. An unsaturated polyester resin composition which comprises (A) a reaction product between (1) a saturated polyester having a molecular weight of about 3,000 – 50,000 obtained from a saturated polycarboxylic acid and a polyhydric alcohol and (2) an unsaturated monoglycidyl compound, (B) an unsaturated polyester, and (C) an unsaturated monomer copolymerizable with the reaction product (A) and the unsaturated polyester (B).

4,102,945

FILLED CYANOACRYLATE ADHESIVE COMPOSITIONS

Edward Roger Gleave, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 11, 1977, Ser. No. 814,582
Claims priority, application Ireland, Jul. 14, 1976, 1554/76
Int. Cl.[2] C08L *9/00*
U.S. Cl. 260—879 **4 Claims**

1. A thickened, curable adhesive composition comprising:
(a) a monomeric ester of 2-cyanoacrylic acid,
(b) for each 100 parts by weight of monomeric ester, about 3 to about 30 parts by weight of an organic material which is an acrylo-nitrile-butadiene-styrene terpolymer
said composition having improved peel strength over the corresponding unthickened adhesive.

4,102,946

PROCESS FOR CARBOXYLATION OF ETHYLENE-VINYL ACETATE COPOLYMERS OR SAPONIFIED COPOLYMERS

Shinichi Imura; Mitsutaka Saito, and Nobuo Morishita, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Jan. 4, 1977, Ser. No. 756,869
Claims priority, application Japan, Mar. 19, 1976, 51/29338
Int. Cl.[2] C08F *263/04*
U.S. Cl. 260—878 R **10 Claims**

1. A process for the carboxylation of ethylene-vinyl acetate copolymers or saponified copolymers comprising:
copolymerizing an alpha, beta-unsaturated carboxylic acid and/or anhydride thereof with or without at least one vinylidene monomer having the formula:

wherein X and Y can be the same or different, and each represents hydrogen, chlorine, alkyl acetoxy, carboxylic acid ester group or cyano; with a solid particulate ethylene-vinyl acetate copolymer or a saponified copolymer in the presence of a polymerization initiator in a reaction medium of an acetic acid ester or a mixture of an acetic acid ester and a lower alcohol, wherein the reaction is conducted in such manner that the copolymer retains its particulate form throughout the reaction.

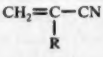
4,102,947

RUBBER-MODIFIED ACRYLONITRILE COPOLYMERS PREPARED IN AQUEOUS SUSPENSION

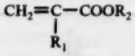
Bruce O. Budinger, Macedonia, and June T. Duke, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 11, 1977, Ser. No. 786,236
Int. Cl.[2] C08F *279/04*
U.S. Cl. 260—879 **5 Claims**

1. The process comprising polymerizing in an aqueous suspension in the substantial absence of molecular oxygen at a temperature in the range of from 0° to 100° C and in the presence of a free radical initiator and an alcohol containing from 1 to 4 carbon atoms 100 parts by weight of
(A) at least 50% by weight of at least one nitrile having the structure

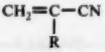


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and
(B) up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of
(1) a vinyl aromatic monomer selected from the group consisting of styrene, alpha-methyl styrene, the vinyl toluenes, and the vinyl xylenes;
(2) an ester having the structure

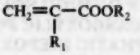


wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms;
(3) an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms;
(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers;
(5) a vinyl ester selected from the group consisting of vinyl acetate, vinyl propionate, and the vinyl butyrates; and
(6) at least one member selected from the group consisting of indene and coumarone,
in the presence of from 1 to 40 parts by weight of
(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

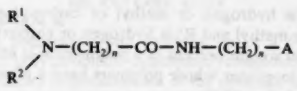
4,102,948

ω-AMINOCARBOXYLIC ACID AMIDE PHOSPHATES

László Feuer; Árpád Furka; Ferenc Sebestyén; Anikó Horváth, and Jolán Hercsel nee Szepespataki, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed May 2, 1977, Ser. No. 792,917
Claims priority, application Hungary, May 6, 1976, CI 1662
Int. Cl.[2] C07F *9/09*; A01N *9/36*
U.S. Cl. 260—944 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

A is $—OPO(OH)_2$;

R^1 is hydrogen, acetyl or benzoyl;

R^2 is hydrogen; and

n is 2 or 3.

4,102,949

PRODUCTION OF 3,4-DIHYDROXY PHOSPHOLANE OXIDES

Reinhard Schliebs, and Hans-Dieter Block, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

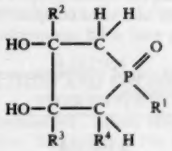
Filed Jan. 11, 1977, Ser. No. 758,527

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602646

Int. Cl.² C07F *9/32, 9/53*

U.S. Cl. 260—985 **2 Claims**

1. A process for the preparation of a 3,4-dihydroxy phospholane oxide of the formula

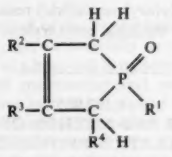


in which

R^1 represents an alkyl, alkoxy, alkenyl, alkenyloxy, alkinyl or alkinyloxy with up to 18 carbon atoms and substitution products thereof; aryl and aryloxy having up to 14 carbon atoms and substitution products thereof; cycloalkyl and cycloalkoxy having up to 6 ring carbon atoms and substitution products thereof; dialkylamino having up to 6 carbon atoms per alkyl radical and substitution products thereof; and N-hetero-radicals, and

R^2, R^3 and R^4 independently of one another represent a C_1–C_4-alkyl radical or hydrogen,

comprising reacting a phospholene oxide of the formula



with hydrogen peroxide in the presence of a catalytic amount of an osmium compound at a temperature in the range of about 20° to 150° C.

4,102,950

METHOD FOR PRODUCING SINGLET MOLECULAR OXYGEN

Donald Pilipovich, Agoura; Ira B. Goldberg, Thousand Oaks, and Ross I. Wagner, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 12, 1977, Ser. No. 823,910

Int. Cl.² C01B *13/02*

U.S. Cl. 423—579 **19 Claims**

1. A method of producing a mixture of gases containing singlet molecular oxygen comprising the steps of:

providing chlorine fluorosulfate;

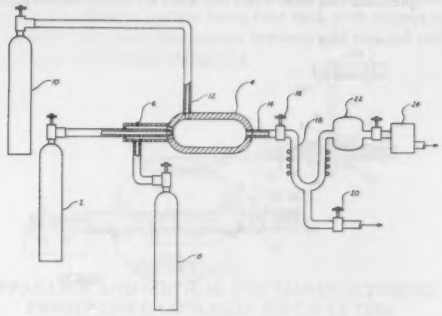
providing a solution of hydrogen peroxide and a base;

mixing said chlorine fluorosulfate and said hydrogen peroxide whereby singlet molecular oxygen is formed by a reaction between said chlorine fluorosulfate and said hydrogen peroxide;

running products of said reaction through a cold trap to remove condensables from said products; and

withdrawing said singlet molecular oxygen and noncondensed gases.

11. A method of producing a mixture of singlet molecular oxygen and reactant constituents and products, comprising the steps of:



providing $ClNO_3$;

providing hydrogen peroxide; and

mixing said $ClNO_3$ and said hydrogen peroxide, whereby singlet molecular oxygen is formed by a reaction between said $ClNO_3$ and said hydrogen peroxide.

4,102,951

CALCINATION OF BASIC FERRIC SULPHATES

Frank Lawson, Glen Waverley, Australia, assignor to Monash University, Clayton, Australia

Filed May 7, 1976, Ser. No. 684,004

Claims priority, application Australia, May 14, 1975, 1584/75

Int. Cl.² C01G *49/02;* H01F *1/10*

U.S. Cl. 423—594 **11 Claims**

1. Process for the calcination of at least one basic ferric sulfate containing the hydroxide radical while avoiding the production of a corrosive acidic mist in the off-gases from said calcination, said process comprising treating the said basic ferric sulfate in at least two stages consisting essentially of driving off all water contained as hydroxide in said basic ferric sulfate in the substantial absence of SO_3 in a given stage by heating said basic ferric sulfate to a relatively low temperature in the range of about 500°0 to 550° C to produce a dehydrated product which is a compound of Fe_2O_3 and SO_3, and thereafter decomposing said dehydrated product in a further stage to form SO_3 in the substantial absence of water vapor to produce Fe_2O_3, by heating said dehydrated product to a higher temperature above 600° C.

4,102,952

FUEL BURNING CONTROL APPARATUS

Thayer Snipes, 5828 Swallow, El Paso, Tex. 79924

Filed Jul. 25, 1977, Ser. No. 818,826

Int. Cl.² F02M *17/12*

U.S. Cl. 261—44 A **7 Claims**

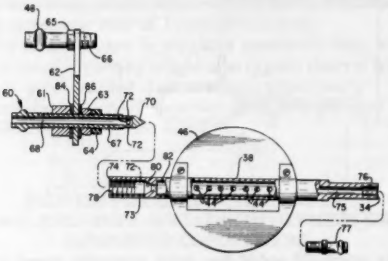
1. A fuel control apparatus comprising a main hollow body having one end open to atmosphere and adapted to be connected at the other end to the intake manifold of an internal combustion engine;

a hollow shaft mounted transversely in said hollow body with opposed marginal ends extending therefrom, a butterfly valve element mounted on said hollow shaft within said main body and arranged to that axial rotation of said shaft moves said butterfly valve element from a closed to an opened position, and vice versa, thereby controlling flow through said main hollow body;

a marginal end of said hollow shaft being threaded, fuel flow ports drilled laterally into a medial part of said shaft in

proximity of said butterfly valve, a valve seat formed within said hollow shaft between said threaded end and said fuel flow ports;

a needle valve assembly having a valve element on one end, a fuel inlet end, a radial fuel port, and a threaded marginal area which threadedly engages the threaded end of said shaft while said valve element engages said seat to thereby preclude fuel flow when said shaft is rotated one direction,



and progressively increases fuel flow therethrough when said shaft is rotated an opposite direction;

a bracket affixed to said main body and extending therefrom and into engagement with said needle valve assembly;

and means by which the needle valve assembly can be adjustably positioned respective to said bracket and seat so that the fuel flow through said seat is proportional to the flow of air across the butterfly valve.

4,102,953

METHOD FOR MAKING EXTRUDED, SOLVENTLESS, COMPOSITE-MODIFIED DOUBLE BASE PROPELLANT

Craig E. Johnson, Indian Head; Paul F. Dendor, Temple Hills, and Elmer R. Csanady, Forest Heights, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,763
Int. Cl.[2] C06B *21/00*
U.S. Cl. 264—3 B **19 Claims**

1. A method for formulating an extrudable composite-modified double-base propellant having an appreciable quantity of ballistic solids, which comprise the steps of:

preparing a first solution comprising a liquid aliphatic hydrocarbon solvent selected from the group consisting of heptane, hexane, and octane, a first portion of active plasticizers selected from the group consisting of nitroglycerin, metroil trinitrate, triethylene glycol dinitrate, pentaerythritol trinitrate and mixtures thereof, a first portion of relatively non-active plasticizers selected from the group consisting of dinormal propyl adipate, dibutyl phthalate, dimethyl phthalate, diethyl phthalate, dioctyl phthalate, diisobutyl azelate, dimethyl sebacate, dibutyl sebacate, and mixtures thereof, and a first portion of filler ingredients selected from the group consisting of ethyl centralite, resorcinol, candelilla wax, 2-nitro diphenyl amine, aluminum lead oxide, lead stamate, lead salicylate, copper salicylate, lead β resorcylate, copper β resorcylate, and mixtures thereof;

mixing a solid binder ingredient selected from the group consisting of from 12 to 14.14% nitrogen nitrocellulose, into said first solution so as to form a first slurry;

agitating said first slurry for from about 30 to about 60 minutes at a rate from about 3500 to about 5000 revolutions per minute, so as to deagglomerate and bruise the surface of the selected solid binder ingredient;

mixing into said first slurry a second portion of the selected relatively non-active plasticizers so as to coat said deagglomerated solid binder ingredient;

separating and saving said first liquid aliphatic hydrocarbon solution from said coated solid binder;

drying said coated solid binder to remove any remaining liquid aliphatic hydrocarbon and any traces of water;

determining the amount of the selected liquid aliphatic hydrocarbon lost in separating and drying;

forming a second slurry by re-slurrying said dry coated solid binder in a second solution comprising a mixture of said saved solution and enough of the selected liquid aliphatic hydrocarbon to replace that lost in separating and drying;

mixing a solid oxidizer selected from group consisting of nitroquanidine, ammonium perchlorate, ammonium nitrate, cyclotetramethylenetetranitramine, and cyclotrimethylenetrinitramine into said second slurry to obtain a uniform dispersion of said solid oxidizer and said coated solid binder;

forming a solid composition by mixing into said dispersion a second portion of the selected active plasticizer ingredients and the selected fillers, and a third portion of the selected relatively non-active plastizers, so as to evenly coat said solid oxidizer and begin to penetrate said coated solid binder;

separating and saving the resulting liquid aliphatic hydrocarbon solution from said solid composition;

drying and curing said solid composition until it is fully plasticized; and

extruding the dried cured composite-modified double-base propellant composition.

4,102,954

CASTING OF PPS FILM

Harold D. Coale, deceased, late of Bartlesville, Okla. (by Geneva N. Coale, executrix), assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 29, 1977, Ser. No. 782,461
Int. Cl.[2] B29C *1/04*
U.S. Cl. 264—24 **9 Claims**

1. A process for producing a poly(arylene sulfide) film comprising the steps of:

(a) applying a metal oxide release agent consisting essentially of at least one member of the group consisting of copper oxide and iron oxide to a metal substrate;

(b) applying a layer of a poly(arylene sulfide) resin over said release agent;

(c) curing said poly(arylene sulfide) resin; and

(d) removing the resulting poly(arylene sulfide) film from said substrate.

4,102,955

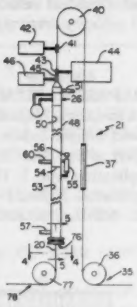
APPARATUS FOR AND METHOD OF HEAT CURING ELECTRICAL INSULATION PROVIDED ON A CENTRAL ELECTRICAL CONDUCTOR OF AN ELECTRICAL CABLE

John E. Baker, Wilmington, Del., and Charles C. Shackford, West Chester, Pa., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 575,943, May 9, 1975, Pat. No. 4,043,722. This application May 23, 1977, Ser. No. 799,610
Int. Cl.[2] B29H *5/26*; B29G *7/00*
U.S. Cl. 264—25 **7 Claims**

1. A method of continuously heat curing heat-curable electrical insulation provided on an electrical conductor comprising the steps of, passing the conductor with uncured heat-curable electrical insulation thereon through a tubular electrical induction coil supported concentrically within an outer housing made of an electrically conductive material and substantially avoiding detrimental induction heating of said outer housing by use of a magnetic flux shield arranged within said housing and surrounding said induction coil, and flowing an alternating electrical current through said coil at a frequency ranging between 7,500 and 30,000 Hertz while passing the insulated structure therethrough to thereby heat said conductor which in turn transmits heat to the inner portion of the insulation to provide heat curing thereof from said inner por-

tion radially outwardly, said shield providing a path of least resistance for lines of magnetic flux generated by said coil to thereby prevent said housing from being heated excessively and assuring precision heating of said conductor.

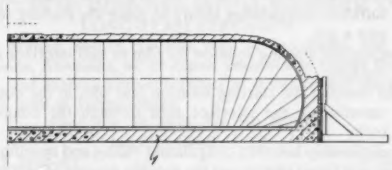


4,102,956

BUILDING METHOD AND EQUIPMENT FOR USE THEREWITH

Haim Heifetz, 3 Bustanai Str., Ramat Hasharon, Israel

Filed Jan. 29, 1976, Ser. No. 653,509
Claims priority, application Israel, Jan. 29, 1975, 46523
Int. Cl.[2] E04B *1/16*
U.S. Cl. 264—32 **2 Claims**



1. A building method of the kind wherein an inflatable former, made of a flexible, substantially inextensible material, is sealingly anchored to a base and is inflated to a predetermined pressure and, whilst maintaining said pressure substantially constant, cementitious material is applied to the outer surface of the former to a required thickness and after the material has set the former is deflated, released from the base and removed for reuse, including the steps of:

(a) pneumatically inflating the former to a predetermined initial inflation pressure;

(b) surrounding substantially vertical or steeply sloping portions of said former with shuttering walls spaced from said portions by a predetermined wall thickness;

(c) casting cementitious material in the space between said shuttering walls and said former;

(d) applying successive layers of cementitious material to remaining portions of said former; and

(e) continuously or intermittently raising said inflation pressure from an external source to an extent substantially equivalent to the oppositely directed successive loads applied to said former as a consequence of the increasing thickness of said layers;

whereby side wall bulging is eliminated.

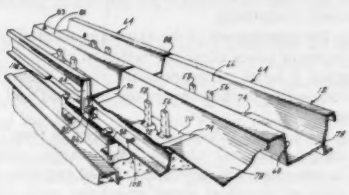
2. In a building method of the kind wherein an inflatable former, made of a flexible, substantially inextensible material, is sealingly anchored to a base and is inflated to a predetermined pressure and, whilst maintaining said pressure substantially constant, a cementitious material is applied to the outer surface of the former to a required thickness and after the material has set the former is deflated, released from the base and removed for reuse, the improvement comprising anchoring the former to a continuous vertical base ring anchored to the base, surrounding the former, by clamping a peripheral portion of said former adjacent a rim of said former, said rim being of flexible material of enlarged thickness as compared with the former walls, between the interior of said ring and appropriate clamping strips with said rim directed in the direction of inflation of said former and contacting said base ring above said clamping strips, said peripheral portion being bent back with respect to the former walls, such that leakage between said rim and said base ring is substantially eliminated.

4,102,957

APPARATUS AND METHOD FOR MANUFACTURING PRESTRESSED CONCRETE RAILWAY TIES

Cipriano Da Re, Laval-sur-le-Lac, Canada, assignor to Canfarge LTD (Francon Division), Montreal, Canada

Filed Nov. 20, 1975, Ser. No. 633,816
Int. Cl.[2] B28B *11/12, 23/04*
U.S. Cl. 264—39 **7 Claims**



1. A method of manufacturing multiple prestressed concrete railway ties with a longitudinal casting mold which is formed of a series of interconnected, individually movable mold sections, comprising the steps of:

(a) exerting a pull at opposite ends of the casting mold to provide a gap to a predetermined extent between each of said interconnected movable mold sections,

(b) securing in a series of openings appropriately located in the bottom wall of said longitudinal casting mold, a corresponding number of rail anchor devices,

(c) placing longitudinally in said mold a series of prestressing wires,

(d) anchoring said wires at opposite ends of said mold and exerting on said wires a predetermined prestressing force,

(e) pouring concrete in said mold around said anchor devices and said wires to form a continuous piece of prestressed concrete,

(f) curing said piece of concrete,

(g) transferring said prestressing force to said piece of concrete whereby movement of the mold sections tending to close said gap is permitted,

(h) effecting a first cutting of said piece of concrete to form a plurality of sections, each section having a given number of individual railway ties,

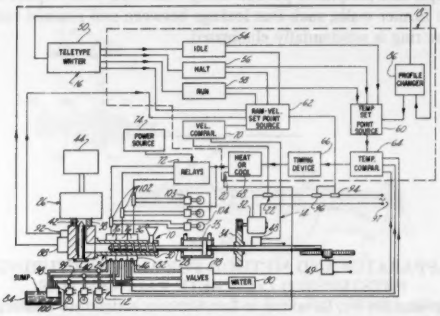
(i) removing said sections from said mold and depositing said sections on conveyor means, and

(j) effecting a second cutting in said sections to provide a plurality of individual railway ties.

4,102,958
METHOD OF CONTROLLING AN EXTRUDER

James B. Wertz, Setanket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 466,489, May 2, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,426
Int. Cl.[2] B30B *15/14, 15/20;* B29F *3/00*
U.S. Cl. 264—40.6 2 Claims



1. In an improved method of controlling an extrusion apparatus of the type having an extruder chamber and a movable extruder ram mounted in said extruder chamber for moving extrusion material through a series of zones extending along the extrusion chamber and out an extrusion chamber outlet, the improvement comprising:

sensing the temperature of the extrusion material in each of the series of zones along the extrusion chamber;

generating a series of temperature signal quantities each corresponding to the temperature of one of said series of zones;

sensing a rotational velocity of said extruder ram;

generating a rotational velocity signal quantity corresponding to the rotational movement of said extruder ram;

generating as electrical signal quantities mode operating command signal quantities, each corresponding to a selected one of plural operating modes;

generating as an electrical signal quantity a rotational velocity command signal quantity corresponding to a desired rotational velocity of said extruder ram;

selecting one of said plural operating modes;

electronically developing a series of temperature set point signal quantities for the selected operating mode such that each temperature set point signal quantity corresponds to a desired temperature for a respective zone of said series of zones;

electronically developing a rotational velocity set point signal quantity corresponding to the desired rotational velocity of said extruder ram for the selected operating mode;

electronically comparing the series of temperature set point signal quantities with the series of sensed temperature signal quantities;

electronically generating a series of temperature error signal quantities corresponding to the variation between the set point temperature and the sensed temperature for each of the series of zones and presenting said temperature error signal quantities as an output from said controller;

electronically comparing the rotational velocity set point signal quantity with the sensed rotational velocity signal quantity;

electronically generating a rotational velocity error signal quantity corresponding to the difference between the rotational velocity set point and the sensed rotational velocity and presenting said rotational velocity error signal quantity as an output from said controller;

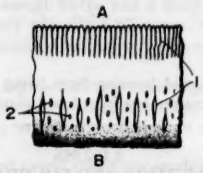
adjusting the temperature of said series of zones to correspond to said set point temperatures in response to said temperature error signal quantities; and

adjusting the rotational velocity of said extruder ram to correspond to said rotational velocity set point in response to said rotational velocity error signal quantity.

4,102,959
PROCESS FOR PREPARING FILM BY WET METHOD

Junichiro Maehara, Sodegaura, Japan, assignor to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 701,795, Jul. 1, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,436
Claims priority, application Japan, Jul. 31, 1975, 50/92535
Int. Cl.[2] B05D *3/00;* D02G *3/22*
U.S. Cl. 264—41 18 Claims



1. A process for preparing a film having asymmetric cross-sectional structure by wet method from a starting solution for a film, which comprises:

forming a coagulation bath containing an upper liquid phase and a lower liquid phase, said liquid phases being immiscible with each other, defining an interface area with each other, and at least one of the two liquid phases having a sufficient coagulating ability to make the starting solution into a gel,

feeding the starting solution for film to said interface area in the bath,

and forming the starting solution into film in the course of traveling in the interface area through the coagulation bath,

the relationship between coagulating values and specific gravities of said liquid phases and the specific gravity of said starting solution being

(A) $G_2 > G_1 \geqq G_0$ when $P_1 \leqq 20 \leqq P_2$,

(B) $G_0 \geqq G_2 > G_1$ when $P_2 \leqq 20 \leqq P_1$, and

(C) $G_2 \geqq G_0 \geqq G_1$ when $P_1 \leqq 20 \leqq P_2$,

wherein

G_0 is the specific gravity of the starting solution,

G_1 is the specific gravity of the upper of said two liquid phases in said bath,

G_2 is the specific gravity of the lower of said two liquid phases in said bath,

P_1 is the coagulation value of said upper phase, and

P_2 is the coagulation value of said lower phase.

4,102,960
PROCESS FOR MAKING HIGH STRENGTH FLEXIBLE GRAPHITE FOIL

John W. Borkowski, Ridgway, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Filed Dec. 15, 1976, Ser. No. 750,906
Int. Cl.[2] C04B *35/52*
U.S. Cl. 264—42 11 Claims

1. A process for making a high strength flexible graphite foil, comprising heating finely divided graphite flake in the presence of boron to a temperature between about 1700° C and 3000° C until the boron has substantially completely permeated the crystal structure of the graphite flake, then subjecting the graphite flake to an intercalating agent and rapidly heating to

a temperature between 300° C and 1100° C to expand the flake until it has a bulk density substantially lower than expanded flake not pretreated with boron, compressing the expanded graphite to make a preform, and further compressing the preform to form a flexible graphite foil.

4,102,961

METHOD FOR THE PRODUCTION OF LARGE-SIZE DENSELY SINTERED CERAMIC PLATES WITH A LOW WALL THICKNESS

Gottfried Cremer, Steyrer Weg 6, 5000 Köln-Junkersdorf, Germany

Filed Mar. 18, 1977, Ser. No. 779,247
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613400
Int. Cl.² B28B *11/00*
U.S. Cl. 264—57 7 Claims

1. A method of producing large format, densely sintered thin walled ceramic plates, comprising the steps of:

extruding a ceramic composition by means of an extruder to form a billet;

rolling out the billet in a direction generally perpendicular to the direction of extrusion;

rolling out the billet in the direction of extrusion after said perpendicular rolling out to form a thin walled plate;

cutting the plate with a knife with a pressing action perpendicular to the plane of the plate to form a plate of a desired size and format; and

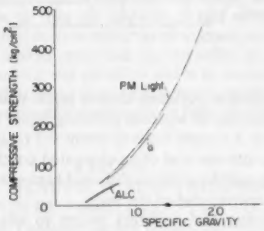
drying and firing said plate.

4,102,962

PROCESS FOR MANUFACTURING CONCRETE ARTICLES OF IMPROVED INITIAL STRENGTH AND LONG-TERM STRENGTH

Fumio Matsui; Shigeo Hayashi, both of Yokohama, and Eiji Komada, Kawasaki, all of Japan, assignors to Showa Denko K.K. and Misawa Homes Institute of Research and Development, both of Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,376
Int. Cl.² C04B *15/12*
U.S. Cl. 264—82 5 Claims



1. A process for manufacturing concrete articles of improved initial strength and long-term strength from a mixture containing a hydraulic cement composition capable of forming predominantly tobermorite group crystalline calcium silicate hydrate, which comprises the steps of:

(a) setting initially in a mold at a temperature of not higher than 40° C said mixture containing the hydraulic cement composition, 10 to 35% by weight, based on the weight of said hydraulic cement composition, of alumina cement, and 5 to 30% by weight, based on the weight of the alumina cement and expressed in terms of the weight of calcium hydroxide or calcium oxide;

(b) after demolding the concrete so formed, allowing the concrete to stand at a temperature of not higher than approximately 40° C for a period of 2 hours to 5 days, and then

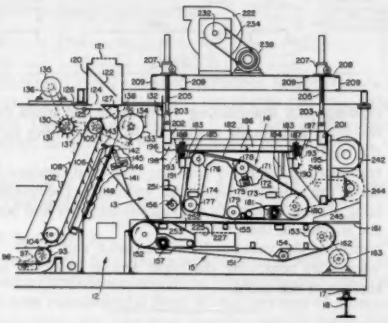
(c) curing the concrete in an autoclave at a temperature of 150° to 200° C and saturated steam pressure for a period of 3 to 10 hours.

4,102,963

METHOD OF FORMING LIGNOCELLULOSIC FIBER MATS

Dennis E. Wood, Rochester, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Division of Ser. No. 661,350, Feb. 25, 1976, Pat. No. 4,035,121. This application Aug. 2, 1976, Ser. No. 711,097
Int. Cl.² B29J *5/00*
U.S. Cl. 264—91 4 Claims



1. A method of forming a lignocellulosic fiber mat, comprising

feeding resin treated lignocellulosic fibers into the upper end of an upright expansion chamber and beneath a stream of air which blows into the upper end of said chamber to direct the fibers downwardly in said chamber,

guiding the falling fibers into an air bridge defined by a wedge-shaped section formed adjacent the lower end of said chamber, said wedge shaped section having a relatively wide end opening on said expansion chamber, and a relatively narrow end being in communication with a condenser chamber, which is located adjacent said expansion chamber,

drawing the fibers by vacuum through said wedge-shaped section and into a mat-forming space formed between the confronting runs of a pair of endless belt members which are mounted one above the other in said condenser chamber, and

causing said confronting runs of said members to travel in the same direction and away from said wedge-shaped section, whereby the fibers entering said space between said runs are progressively advanced and compacted between said runs into a fiber mat.

4,102,964

METHOD FOR MANUFACTURING RIGID ARTICLES HAVING A CUSHIONED SURFACE

Louis H. Ridgeway, Jonesville, S.C., assignor to Facetglas, Inc., Rock Hill, S.C.

Continuation-in-part of Ser. No. 535,678, Dec. 23, 1974, Pat. No. 4,069,523. This application Jun. 17, 1976, Ser. No. 696,879
Int. Cl.² B29C *17/04;* B29D *3/02, 9/00*
U.S. Cl. 264—92 5 Claims

1. A method of manufacturing a large rigid article having a cushioned surface employing an assembly line having spaced treating stations including a molding station for shaping cushioned sheet material in a vacuum forming operation, a coating station for applying a flowable, rigidizable material to an exposed surface of the shaped cushioned sheet, and a rigidizing station for rigidizing and bonding the flowable material to the exposed surface of the shaped sheet, comprising the steps of

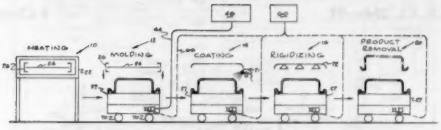
a. providing a formable, drapable sheet of resiliently deform-

able cushioning material which does not become self-supporting in shape after forming;

b. applying the sheet to the exposed shaping surface of a portable, vacuum forming mold while drawing a vacuum on the mold to intimately conform the sheet to the shaping surface;

c. transporting the mold containing the sheet under vacuum thereon to the spaced coating station;

d. coating the exposed surface of the sheet on the mold with a bondable, rigidizable layer of resinous material while



continuously maintaining vacuum on the mold to retain the sheet in intimate contact with the molding surface of the mold;

e. transporting the mold with the sheet and rigidizable layer while the mold remains under vacuum to the spaced rigidizing station to solidify the rigidizable layer and bond it to the surface of the sheet;

f. removing the vacuum from the mold; and

g. thereafter removing the rigid article from the molding surface of the mold.

4,102,965

PROCESS FOR THE PRODUCTION OF POLYAMIDE-6-FILAMENTS OF THE γ-MODIFICATION

Harry Kubitzek; Karlheinz Feltgen, and Friedrich-Karl Rosendahl, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 10, 1976, Ser. No. 665,852

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1975, 2510917; Nov. 11, 1975, 2550551

Int. Cl.[2] D02G *1/20*

U.S. Cl. 264—103 **5 Claims**

1. A process for the production of continuous polyamide-6-filaments present in the γ-modification both before and after stretching at room temperature wherein polyamide-6 with a relative solution viscosity of from 2.3 to 3.1, preferably of from 2.6 to 2.85, as measured on a 1% solution in m-cresol as spun and wherein the resulting filaments

a. after leaving the spinneret, are air-cooled and preoriented up to an elongation at break of from 50 to 80% by being run off at a speed of 3700 to 4500 m/minute,

b. before winding into package form and during take-off, the filaments are prepared with an aqueous preparation oil in such a way that they contain less than 3.0% by weight of water, and

before winding into package form the filaments are subjected to interlacing.

4,102,966

METHOD OF MOLDING POLYTETRAFLUOROETHYLENE

Gilbert Duperray, Lozanne; André Monnet, Lyon, and Claude Tournut, Francheville, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Mar. 29, 1976, Ser. No. 671,042

Claims priority, application France, Apr. 16, 1975, 75 11770

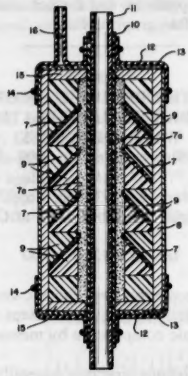
Int. Cl.[2] B29C *3/00*

U.S. Cl. 264—112 **13 Claims**

1. A method for making a composite, complex, molded structure from granular polytetrafluoroethylene powder comprising:

a. compressing granular polytetrafluoroethylene powder at a pressure between about 10 and 50 bars to cohere the granules into a consolidated preform,

b. placing the preform in contact with additional polytetrafluoroethylene granules in an isostatic mold, and



c. subjecting the preform in step (b) to isostatic molding at a pressure between about 100 and 1000 bars to cohere the preform and the additional granules into a complex, molded, composite structure.

4,102,967

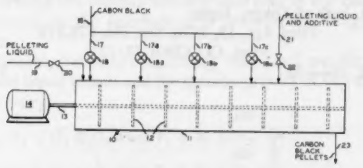
PELLETING OF CARBON BLACK

John W. Vanderveen, and Harold R. Hunt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 9, 1976, Ser. No. 713,073

Int. Cl.[2] B01J *2/10*

U.S. Cl. 264—113 **9 Claims**



1. A method of pelleting carbon black which comprises:

(a) introducing an aqueous pelleting liquid and loose carbon black in a weight ratio of about 2:3 to about 2:1, respectively, into one end of an elongated continuous pellet mill having agitating means disposed between the said one end and a second end of the mill;

(b) actuating said agitating means to mix said liquid and carbon black to form pellets and to move said pellets toward the second end of the mill;

(c) introducing additional loose carbon black into the mill through at least one inlet positioned between said one end and said second end so that the average residence time of the pellets between said one end and the inlet is at least one minute, the amount of carbon black introduced through each of said at least one inlet being about 10 to about 50 percent by weight of the carbon black introduced into said one end and the total amount of carbon black introduced through said at least one inlet being in the range of about 50 to about 150 percent by weight of the carbon black introduced into said one end;

(d) introducing additional liquid into said mill between the last inlet and said second end of the mill, said additional liquid being selected from the group consisting of (1) a aqueous liquid containing a carbohydrate, a surface active agent or a hydrocarbon oil and (2) a hydrocarbon oil, the amount of additional liquid so added being in the range of

about 5 to about 50 percent by weight of the amount of liquid introduced into said one end, the amount of carbohydrate, surface active agent or hydrocarbon oil being in the range of about 0.02 to about 0.5 weight percent of the total amount of carbon black introduced into the mill, and the location at which the additional liquid is added being spaced from said second end of the mill so that agitation is imparted to the pellets after the additional liquid is added, thereby forming layered pellets containing the additional liquid substantially only in an outer layer of the layered pellets; and

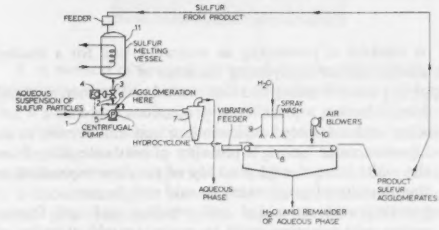
(e) removing said layered pellets from the second end of the mill.

4,102,968

AGGLOMERATION OF FINELY DIVIDED SULFUR PARTICLES IN A LIQUID SUSPENSION

Bruce F. Caswell, Green Oaks Township, Livingston County, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

Filed Jul. 11, 1977, Ser. No. 814,486
Int. Cl.[2] B01J *2/28*
U.S. Cl. 264—117 **7 Claims**



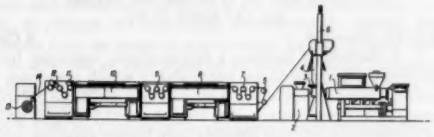
1. A process for preparing agglomerates of finely divided sulfur particles, which comprises the steps of continuously feeding into an agglomeration system (1) a first stream of a suspension of finely divided sulfur particles suspended in an aqueous liquid medium, and (2) a second stream consisting essentially of molten sulfur, continuously agitating the contents of the agglomeration system to effect collisions between said sulfur particles and contacts between said sulfur particles and said molten sulfur so that the surfaces of said sulfur particles are wetted with said molten sulfur so as to cause said particles to stick together and to cause said molten sulfur to solidify, in situ, while it is undergoing agitation and is in contact with the sulfur particles whereby to form solid sulfur agglomerates, and then recovering said sulfur agglomerates from the liquid phase.

4,102,969

METHOD FOR MANUFACTURING CRIMPED TEXTILE ELEMENTS BY FIBRILLATION OF FILMS

Jean-Louis Neveu, Lozanne; Gerard Berliet, and Angelo Dervissoglou, both of Lyons, all of France, assignors to Institut Textile de France and Agence Nationale de Valorisation de la Recherche, both of France

Filed Apr. 5, 1976, Ser. No. 673,471
Claims priority, application France, Apr. 10, 1975, 75 11489
Int. Cl.[2] B29H *7/18*
U.S. Cl. 264—147 **5 Claims**



1. In a process for producing crimped textile elements such as fibers and continuous filaments, by fibrillation of a bicomponent film comprising:

extruding a bilaminate film wherein the first face comprises a copolyolefin polymer based predominantly of polypropylene and the second face another polyolefin polymer different from the first,

orienting the extruded film by stretching, and

fibrillating the oriented film;

the improvement wherein the second face comprises a mixture of at least:

a homopolyolefin polymer,

an acidic vinyl terpolymer in an amount by weight of less than about 20% of the weight of the mixture, and

a polyamide in an amount by weight of less than about 10% of the weight of said mixture.

4,102,970

THERMOSETTING COMPOSITIONS WHICH CAN BE CURED TO FORM MOLDED OBJECTS OR COATINGS

Bernward Deubzer, and Werner Graf, both of Burghausen, Germany, assignors to Wacker-Chemie BmbH, Munich, Germany

Continuation of Ser. No. 607,724, Aug. 25, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,576
Int. Cl.[2] B28B *3/20*
U.S. Cl. 264—176 R **9 Claims**

5. A method for preparing a molded article which comprises preparing a composition consisting essentially of (1) an organopolysiloxane containing at least 40 mol percent of monoorganosiloxane units and having at least 0.1 percent by weight of condensable groups, (2) a filler, (3) a condensation catalyst and (4) a diorganopolysiloxane which is incompatible with organopolysiloxane (1) and has a viscosity of at least 30 cSt at 25° C in which the diorganopolysiloxane (4) is present in an amount of from 15 to 30 percent by weight based on the weight of the organosiloxane (1) and the resultant mixture consisting essentially of organopolysiloxanes (1) and (4) forms two phases and thereafter introducing the composition into a mold having the desired configuration and thereafter curing the molded article.

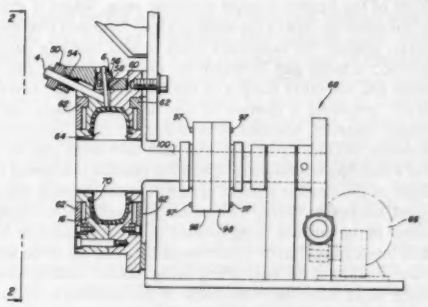
6. The method of claim 5 wherein the composition is introduced into an extrusion molding device.

4,102,971

CAST ANNULAR LAMINATES AND METHOD AND APPARATUS FOR MAKING SAME

Sundar L. Aggarwal, Akron; Leon F. Marker, Cuyahoga Falls; Thomas J. Dudek, Tallmadge, and Robert J. Herold, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 14, 1977, Ser. No. 777,200
Int. Cl.[2] B29C *5/04*; B29D *23/08*; B29H *3/00, 5/02*
U.S. Cl. 264—255 **6 Claims**



1. A method of making an annular laminar structure of cured

resinous material by a molding process, the steps of the process comprising:

(a) injecting at least two separate streams of different chemically extendable liquid materials into at least two different circumferential segments of a mold cavity, without mixing the at least two materials and without movement of the mold surface, the annular mold cavity having an outer surface which defines the outer surface of the liquid materials and an inner surface which defines the inner surface of the liquid materials;

(b) moving one mold surface relative to the second mold surface while maintaining the two surfaces at the same distances from each other to form alternating layers of different liquid materials;

(c) terminating the relative movement; and

(d) allowing the liquid materials to cure to form an annular laminate of alternating materials having different moduli of elasticity.

4,102,972

REFRACTORY PIPE FITTINGS AND PRODUCTION THEREOF

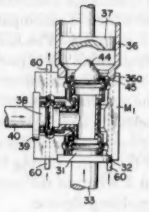
Tomiji Tarukawa, and Hideaki Tarukawa, both of 51-7, Higashiyama-Cho, Itabashi-Ku, Tokyo-To, Japan

Continuation of Ser. No. 594,185, Jul. 8, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 854,575

Claims priority, application Japan, Jul. 19, 1974, 49-82781

Int. Cl.[2] B28B *1/16*

U.S. Cl. 264—256 **5 Claims**



1. A method for producing a refractory pipe fitting having a hollow and rigid inner layer made of a synthetic resin, an outer layer made of a refractory material comprising non-metallic inorganic fibers and inorganic binder material, and an intermediate layer made of a flexible foamed synthetic resin interposed between the inner and outer layers for securing these layers and for permitting displacement and deformation of the inner and outer layers relative to each other, comprising the steps of preparing an outer mold internally formed with a molding cavity conforming to the outer configuration of the outer layer, preparing a composite body made up of a shell of the synthetic resin, which is to form said inner layer, and a thin layer of the flexible foamed synthetic resin, which is attached to the outer surface of the shell and is to form said intermediate layer, placing the composite body in said molding cavity to provide a mold gap between the inner surface of the outer mold and the outer surface of the thin layer of the composite body, preparing a mixture of said inorganic fibers and said binder material, kneaded with water, forcibly supplying the kneaded mixture under pressure into said mold gap to carry out a molding operation in which the mixture is adhered to the layer of the flexible foamed synthetic resin, heating the outer mold internally during the molding operation to cause the water in the mixture being molded to be evaporated to form a thin lubricating film of water vapor between the mold and the outer surface of the pipe fitting being molded, and opening the outer mold, after the completion of the molding operation, to take out the molded pipe fitting with said shell attached to the inner surface of the molded outer layer through said thin layer of the flexible foamed synthetic resin.

4,102,973

METHOD OF PRODUCING AN EXCITATION COIL FOR SHADED POLE ELECTRIC MOTORS

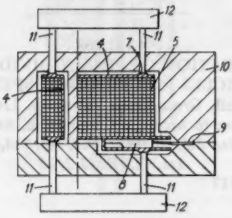
Robert Hanning, Campione d'Italia, Italy, assignor to Hanning Elektro-Werke, Fed. Rep. of Germany

Continuation of Ser. No. 537,372, Oct. 30, 1974, abandoned. This application Jun. 23, 1976, Ser. No. 698,920

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1974, 2400379

Int. Cl.[2] B29F *1/10*

U.S. Cl. 264—272 **8 Claims**



1. A method of producing an excitation coil for a shaded pole electric motor comprising the steps of

applying a coil winding to a thin walled coil former, said coil former having a plurality of projections thereon,

placing said assembled coil winding and coil former in an injection mold having a plurality of pins extending from the walls thereof, said plurality of pins corresponding to the plurality of projections on said coil former,

supporting said assembled coil winding and coil former within said injection mold by engaging said plurality of pins extending from the walls of the injection mold with the corresponding projections on said coil former, said pins providing the sole support for said assembled coil winding and coil former,

injecting into said injection mold a thermoplastics synthetic material having a solid filler therein, said filler having a higher melting point than said thermoplastics material,

allowing said thermoplastics synthetic material to become partially set but still flowable,

retracting said pins into the walls of said injection mold thereby allowing said partially set thermoplastics synthetic material to flow into spaces left by the retraction of said pins,

allowing said thermoplastics synthetic material to set completely, and

removing the formed excitation coil from said injection mold, said coil having a dampness-resisting homogeneous envelope and being non-self-igniting, said thermoplastics synthetic material and solid filler dissipating heat from a short circuit occurring in the interior of the coil by allowing gases generated within said coil to escape through the filler lattice without permitting oxygen to enter the coil.

4,102,974

POLYOLEFIN CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Kenneth A. Boni, Wheaton, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,091

Int. Cl.[2] B29D *23/01*

U.S. Cl. 264—294 **9 Claims**

1. A method of forming a thermoplastic container having increased resistance to gas permeability which comprises preparing a billet comprised of a mixture of a moldable polyolefin resin, an inorganic filler and at least about 13.5 volume percent of a vinylidene chloride polymer resin having a median particle diameter greater than 150 microns and then molding the billet into a hollow container at a temperature of about 25° to about

40° F greater than the melt temperature of the vinylidene chloride polymer.

4,102,975

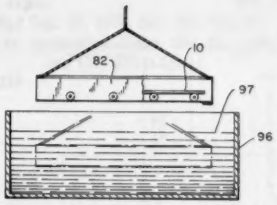
METHOD OF TREATING AND FORMING A PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 344,869, Mar. 26, 1973, Pat. No. 3,948,708. This application Mar. 1, 1976, Ser. No. 661,387

Int. Cl.[2] B29J *1/02*

U.S. Cl. 264—322 6 Claims



1. A method of forming a curved flexible substantially self-supporting sheetlike structure, comprising the steps of providing a panel comprising a sheet of fibrous material formed of wood fibers in a resin binder and having a substantial resistance to bending and being capable of being softened and made sufficiently ductile to permit forming compound curvatures in it without tearing or blowing by the application thereto of water at a temperature in the range of 180° F. to 212° F., providing a body of water at a temperature in said range, totally immersing said panel in said body of water for from 3 seconds to 40 seconds, thereafter placing the panel between heated dies and forming a compound curvature in the same by the application of heat and pressure to the opposite sides thereof by said dies, and holding the panel between said dies until sufficiently dry to hold its shape.

4,102,976

TREATMENT OF ORES OR METALLURGICAL BY-PRODUCTS CONTAINING ARSENIC AND ANTIMONY

Jozef Hiemeleers, Olen; Achille De Schepper, Lichtarrt, and Antoine Van Peteghem, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Mar. 18, 1976, Ser. No. 667,933

Claims priority, application Luxembourg, Apr. 1, 1975, 72186; May 14, 1975, 72477

Int. Cl.[2] C01B *27/00, 29/00*

U.S. Cl. 423—87 38 Claims

1. In a process for treating a metal bearing material containing arsenic and antimony by leaching in an acid solution with an oxygen containing gas under pressure at a temperature of between 20° and 200° C, the improvement which consists in adding at least one element chosen from the group consisting of arsenic and phosphorus in such an amount to the leach mixture that the molar ratio (As + 4P):Sb therein shall be at least equal to 8, thus dissolving at least the major part of the arsenic and antimony contained in the starting material.

36. A process for separating simultaneously arsenic and antimony from an aqueous acid solution having a molar ratio (As + 4P) : Sb at least equal to 8, which process comprises bringing the aqueous solution into contact with an organic phase comprising

(a) 2–30% by volume of an alkylated 8-hydroxyquinoline,

(b) 5–80% by volume of a substance selected from the group of substances consisting of

(a′) phosphonic acid esters having the general formula

$$R_1-P(OR_2)-OR_3,$$

phosphonous acid esters having the general formula $R_1-P(OR_2)-OR_3$, phosphinic acid esters having the general formula

$$R_1-P(OR_2)-OR_3,$$

and phosphinous acid esters having the general formula $R_1-P(R_2)-OR_3$, wherein R_1, R_2 and R_3 represent the same or different, unsubstituted or substituted hydrocarbon groups, and

(b′) organophosphoric compounds having the general formula $(RO)_3P=O$, wherein R represents an unsubstituted or substituted alkyl, aryl or aralkyl group, and

(c) an inert organic diluent,

while maintaining the acid content of the aqueous phase at at least 1N, whereby arsenic and antimony are extracted from the aqueous phase to the organic phase, and separating the resultant arsenic and antimony-charged organic phase from the aqueous phase.

37. A process for separating selectively antimony from an aqueous acid solution containing antimony and arsenic and having a molar ratio (As + 4 P) : Sb at least equal to 8, which process comprises bringing the aqueous solution into contact with an organic phase comprising

(a) 2–30% by volume of an alkylated 8-hydroxyquinoline, and

(b) an inert organic diluent,

while maintaining the acid content of the aqueous phase at at least 1N, whereby antimony is selectively extracted from the aqueous phase to the organic phase, and separating the resultant antimony-charged organic phase from the resultant antimony-barren aqueous phase.

4,102,977

PROCESS FOR THE PREPARATION OF ALKALI ALUMINOSILICATE DETERGENT BUILDER

Yujiro Sugahara, Tokyo; Koichi Usui, Shibata; Masahide Ogawa, Nakajo; Hideaki Kurosaki, Shibata, and Shigehisa Imafuku, Nakajo, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 12, 1976, Ser. No. 741,365

Claims priority, application Japan, Nov. 18, 1975, 50-137814; Nov. 27, 1975, 50-141141; Oct. 13, 1976, 51-121795

Int. Cl.[2] C01B *33/28;* C11D *9/18*

U.S. Cl. 423—118 22 Claims

1. A process for the preparation of detergent builders which comprises acid-treating a smectite clay mineral under such conditions that at least the X-ray diffraction peak of the plane index (001) substantially disappears and removing a basic metal component in the reaction product by extraction to thereby prepare activated silica or activated alumina-silica, treating the so prepared activated silica or activated alumina-silica with an alkali metal hydroxide or a water-soluble alkali metal silicate to prepare an alkali metal polysilicate or alkali metal polyaluminosilicate having a composition in which the Na_2O/SiO_2 molar ratio is in the range of from 1/3.5 to 1/500, mixing said alkali metal polysilicate or alkali metal polyaluminosilicate with additional amounts of alumina and alkali metal components and water to prepare a homogeneous mixture having a composition capable of forming zeolite of the type A, and heating said homogeneous mixture to crystallize out fine zeolitic particles having a maximum primary particle size smaller than 1 μ.

4,102,978

PROCESS FOR PRODUCING ALUMINA CATALYST CARRIERS

Joseph R. Kiovsky, Kent, Ohio, assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 630,317, Nov. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 393,801, Sep. 4, 1973, abandoned. This application May 20, 1977, Ser. No. 798,887

Int. Cl.[2] C01F *7/02*

U.S. Cl. 423—626 1 Claim

1. A method of making a high purity alumina body consisting of providing a mix of

(1) 30 to 80 parts of gibbsite fired to an L.O.I. of less than 8%, said fired material containing chi alumina or its thermal transition products

(2) 20 to 40 parts of microcrystalline boehmite

(3) 0 to 50 parts of desensitized microcrystalline boehmite

adding to said mix from 2 to 10% by weight of acid selected from the monobasic acids having an anion no larger than that of propanoic acid, and from 80 to 120 parts of water per 100 parts by weight of mix, mixing to provide a free flowing mix, forming shapes by pressure from said mix, drying said shapes to remove at least 80% of the added water, and firing said shapes at a temperature of from 625° to 1200° C, whereby the body has a surface area of from 70 to 220 square meters per gram and a crushing strength for 0.1 inch diameter pellets of greater than 7 pounds.

4,102,979

RADIOIMMUNOASSAY FOR BENZOYLECGONINE

James Gordon Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 22, 1976, Ser. No. 725,912

Int. Cl.[2] A61K *43/00;* G01N *33/16*

U.S. Cl. 424—1 5 Claims

1. A method for the radioimmunoassay of benzoylecgonine and cocaine in a sample, which method comprises mixing said sample with a known amount of a radiolabeled benzoylecgonine compound selected from the group consisting of benzoylecgonine - ^{3}H having a specific activity suitable for radioimmunoassay procedures and ^{125}I-4-hydroxybenzoylecgonine thereof and an antibody which will selectively complex with said benzoylecgonine or cocaine, measuring the degree of binding of said radio-labeled benzoylecgonine compound, and determining the amount of benzoylecgonine and cocaine present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of benzoylecgonine or cocaine with fixed amounts of labeled benzoylecgonine compound and said antibody and determining the degree of binding for each known amount of said benzoylecgonine or cocaine.

4,102,980

METHOD FOR REMOVAL OF DUST DEPOSITED ON CONTACT APPARATUS INTERIOR

Takashi Sasaki, and Michio Saima, both of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,839

Claims priority, application Japan, Sep. 25, 1975, 50-114903

Int. Cl.[2] B01J *37/00*

U.S. Cl. 423—239 21 Claims

1. A method for removal of dust deposited on the interior of a contact apparatus which is used to remove harmful components from waste gas emanating from a stationary source and which has a gas-solid contact zone with a plurality of parallel gas channels formed between a plurality of solid bodies that contain an active component for removing harmful components from said waste gas, comprising flowing in free motion through the interior of said apparatus solid particles of average particle diameter of 50 to 2000 μm suspended in a current of a carrier gas at a concentration of solid particles from 20 to 100 g/m^3, the actual linear velocity of said carrier gas within said contact apparatus and in said gas-solid contact zone being from 2 to 15 m/sec and removing the particles and dust with the gas leaving the apparatus.

4,102,981

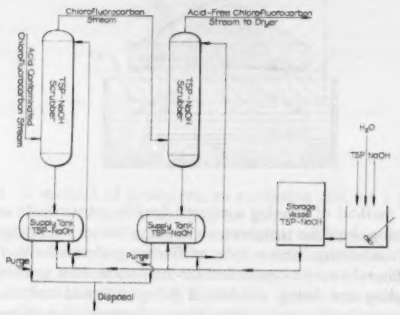
REMOVAL OF ACIDIC IMPURITY FROM CHLOROFLUOROMETHANES

Elias A. Woychesin, Livermore, Calif., and Clovis P. Legleu, III, Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 22, 1977, Ser. No. 826,595

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 6 Claims



1. In the process of removing acidic contaminants from streams containing aliphatic fluorocarbons of the formula $CHCl_nF_{3-n}$, where n is 1 or 2, and the acidic impurity is HCl, by scrubbing the stream with an aqueous solution of trisodium phosphate in a scrubber system, the improvement which comprises scrubbing the HCl-contaminated stream in at least one scrubber with an aqueous solution containing a mixture of trisodium phosphate and sodium hydroxide, the solution having a trisodium phosphate content from about 3% to about 7% by weight and a sodium hydroxide concentration from about 1% to about 6% by weight, at least periodically purging a portion of the aqueous solution after contact with the acid-contaminated fluorocarbon streams, replenishing the purged portion with a substantially equal volume of fresh aqueous scrubbing solution containing essentially the concentration of sodium hydroxide and trisodium phosphate as the scrubbing solution prior to contact with the acid-contaminated fluorocarbon streams, recycling the replenished scrubbing solution to the scrubbing step and disposing of the purged portion.

4,102,982

PROCESS FOR TREATING STACK GASES

Alexander Weir, Jr., 8229 Billowvista Dr., Playa Del Rey, Calif. 90291

Continuation-in-part of Ser. No. 237,812, Mar. 24, 1972. This application Jun. 13, 1974, Ser. No. 478,871

Int. Cl.[2] C01B *17/00, 21/00*

U.S. Cl. 423—242 6 Claims

1. A process for removing gaseous and particulate pollutants from stack gases, wherein the steps comprise:

passing the stack gases through a defined substantially horizontally extending flow path having a substantially unrestricted cross-sectional flow area throughout the length thereof to avoid any substantial pressure drop; and

spraying a sulfur dioxide reactive calcium hydroxide and a nitrogen oxide reactive acid-alkali metal dichromate or permanganate ion containing liquid reagent at a plurality of stages along said flow path and spraying said reagent into said flow substantially perpendicular thereto and substantially cross-current to the flow of stack gases pass-

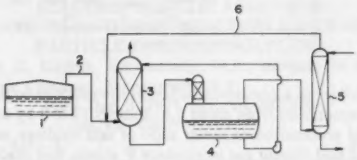
ing therethrough to substantially cover at least at one stage the cross-sectional flow area of said flow path with a sheet of spray droplets of said liquid reagent and thereby effect by said droplets of reagent removal of pollutants from the stack gases.

4,102,983

METHOD OF PURIFYING A GAS CONTAINING VOLATILE ORGANIC MATERIALS

Osamu Yamase, Kanagawa; Tetsuya Iida, Yokohama, and Ichizo Hara, Hiratsuka, all of Japan, assignors to Showa Oil Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,480
Claims priority, application Japan, Sep. 19, 1975, 50-113285
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—245 **3 Claims**



1. A method of purifying a gaseous mixture containing air and vapors of volatile organic materials selected from the group consisting of low boiling petroleum products (e.g. gasoline, naphtha and jet fuel), low boiling liquid products (e.g. aliphatics, naphthenics and aromatics), and also low boiling liquid alcohols, aldehydes, ketones, and chlorine-containing organic materials which comprises contacting said gaseous mixture with an absorption liquid prepared by blending a refined mineral oil with at least one compound selected from the group consisting of methyl ethyl phthalate, diethyl phthalate, dioctyl phthalate, didecyl phthalate, dibutyl phthalate, dimethyl phthalate, dilauryl phthalate, decyl isooctyl phthalate, butyl benzyl phthalate and butyl lauryl phthalate; tetraoctyl silicate and tetranonyl silicate; trioctyl phosphate, tricresyl phosphate, tributyl phosphate, tributoxyethyl phosphate, trixylenyl phosphate, tricresyl diphenyl phosphate, and octyl diphenyl phosphate; dioctyl adipate, dibutyl adipate, dioctyl azelate, dibutyl sebacate, dioctyl sebacate, and butyl oleate; n-dodecyl benzene and isododecyl benzene; α-olefin oligomers having an average molecular weight of 300 to 400 and a kinematic viscosity of 10 to 20 cSt, at 37.8° C,

said mineral oil having an average molecular weight of 200 to 350, **a kinematic viscosity of** 5 to 20 cSt at 37.8° C, and boiling range of 250° C to 450° C under normal pressure, and absorbing said volatile organic materials therefrom into said absorption liquid.

4,102,984

PHOTOLYSIS METHOD FOR PRODUCING NF_4PF_6

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1976, Ser. No. 732,244
Int. Cl.[2] C01B *25/10*
U.S. Cl. 423—301 **1 Claim**

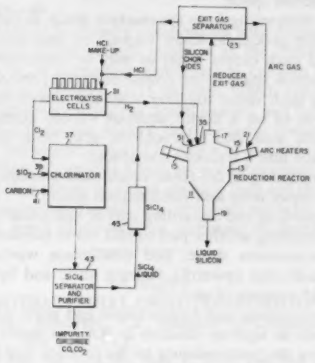
1. A process for the production of NF_4PF_6 characterized by photolyzing a mixture of NF_3,F_2 and PF_5 having an approximate mol ratio of 3:1:3 at −196° C and removing unreacted volatile starting materials from the non-volatile NF_4PF_6 product by pumping at ambient temperature.

4,102,985

ARC HEATER PRODUCTION OF SILICON INVOLVING A HYDROGEN REDUCTION

Francis J. Harvey, II, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,545
Int. Cl.[2] C01B *33/02, 7/08*
U.S. Cl. 423—350 **6 Claims**



1. A process for producing high purity silicon by reduction of a silicon halide comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen, an inert gas, silicon halides, and mixtures thereof through the gap to provide an elongated arc stream extending into the reaction chamber,

(d) feeding into the arc stream a quantity of hydrogen,

(e) feeding into the arc stream a quantity of the halide of silicon to produce reaction products including liquid silicon and hydrogen halides,

(f) projecting the reaction products tangentially into a cyclonic reaction chamber to cause the liquid silicon to separate centrifugally from the gaseous co-products, and

(g) depositing the liquid silicon on a downwardly extending surface to permit the liquid silicon to flow into an associated receptacle.

4,102,986

PROCESS FOR THE CONTINUOUS MANUFACTURE OF NITROUS OXIDE

Jakob Van Rouendal Smit; Panayiotis Hassiotis, and Robert Armistead Hasty, all of Johannesburg, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Continuation-in-part of Ser. No. 542,965, Jan. 22, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,910
Int. Cl.[2] C01B *21/22*
U.S. Cl. 423—402 **16 Claims**

1. In a process for the manufacture of nitrous oxide comprising the decomposition of ammonium and nitrate ions in the presence of chloride ion and high hydrogen ion concentration in an aqueous reaction liquor in a reaction space in a continuous process.

the improvement comprising process conditions:

(a) the concentration of chloride ions being maintained between 0.05 and 0.45 M, the concentration of hydrogen ions being maintained between 3 M and 7 M; the concentration of ammonium ions being maintained between 1 M and the maximum solubility of ammonium ions in the presence of nitrate ions at the reaction tem-

perature and the concentration of nitrate ions being maintained between 4M and 16M;

(b) as said decomposition proceeds, feeding ammonium and nitrate ions and hydrogen and chloride ions into the aqueous reaction liquor contained in the reaction space,

(c) maintaining in the reaction liquor a temperature above 80° C, said temperature being the boiling temperature of the reaction liquor at the ambient pressure inside the reaction space;

(d) withdrawing from the reaction space, as the decomposition proceeds, water formed by said decomposition and such excess water as may be introduced into the reaction space in the course of step (b) above by distilling such water together with the nitrous oxide in the form of an a acidic aqueous vapour containing free nitric acid and hydrochloric acid from the reaction space into a fractionation space;

(e) producing an overhead condensate consisting essential of water over said fractionation space;

(f) removing and discarding part of said water condensate

(g) returning another part of said water condensate to the fractionation space, said condensate washing downwardly the upwardly flowing nitric and hydrochloric acid vapours of step (d);

(h) recovering said hydrochloric and nitric acids as free acids in aqueous solution as bottoms liquor and recycling the bottomsliquor to the reaction space; and

(i) removing overhead from said fractionation space the nitrous oxide in a form essentially depleted of nitric acid and hydrochloric acid.

4,102,987

PROCESS FOR PREPARING SULFURYL-FLUORIDE AND -CHLOROFLUORIDE PRODUCTS

David M. Cook, Pittsburgh, and Douglas C. Gustafson, Antioch, both of Pa., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 616,517, Sep. 25, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,311

Int. Cl.[2] C01B *7/24, 17/45*

U.S. Cl. 423—466 **7 Claims**

1. A process for removing chlorine from a product reaction mixture comprising sulfuryl fluoride and prepared by the reaction of an anhydrous gaseous mixture of sulfur dioxide, chlorine and hydrogen fluoride in the presence of a catalyst comprising activated carbon, said process comprising reacting the product reaction mixture at a temperature of from about 35° to about 145° C. and at a pressure of from about atmospheric to about 65 psi in the presence of a catalyst comprising activated carbon, thereby reducing the free chlorine content of said mixture and converting free chlorine present in said product reaction mixture to sulfuryl chlorofluoride and thereafter separating SO_2F_2 from the product reaction mixture.

4,102,988

CYANO COMPOUNDS AS FUELS FOR HF OR DF LASERS

Pasquale Martignoni; James A. Murfree, Jr.; William M. Chew, and Orval E. Ayers, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1977, Ser. No. 838,519

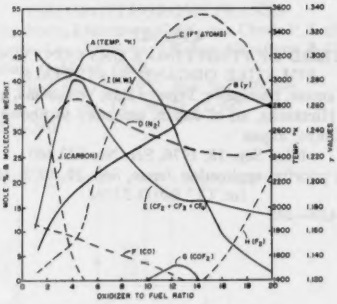
Int. Cl.[2] C01B *7/22*

U.S. Cl. 423—483 **6 Claims**

1. A method of forming vibrationally excited HF or DF molecules which produces lasing, said method comprising:

(i) providing a predetermined molar quantity of a cyano compound fuel selected from the group consisting of dicyanoacetylene, tetracyanoethylene, and tetracyanoethylene oxide and a predetermined molar quantity of an oxidizer compound dispersed in a predetermined molar quantity of a diluent gas selected from the group consisting of helium and nitrogen, said oxidizer selected from the group consisting of fluorine, nitrogen trifluoride, chlorine trifluoride, chlorine pentafluoride, and tetrafluorohydrazine;

(ii) reacting under a predetermined pressure in the range of several atmospheres said cyano compound fuel with said



oxidizer in a combustor wherein the oxidizer to fuel ratio is maintained from about 6 to 1 about 14 to 1 by adjusting said predetermined molar ratio of said oxidizer, said fuel, and said diluent gas to produce F· atoms, and reacting the F· atoms with hydrogen or deuterium to form vibrationally excited HF or DF molecules which produces lasing.

4,102,989

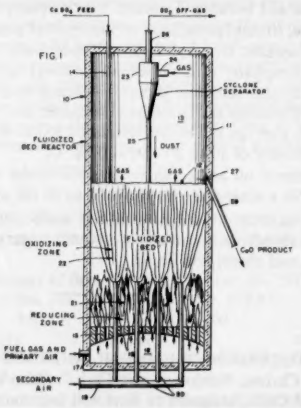
SIMULTANEOUS REDUCTIVE AND OXIDATIVE DECOMPOSITION OF CALCIUM SULFATE IN THE SAME FLUIDIZED BED

Thomas D. Wheelock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 470,053, May 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 583,608, Jun. 4, 1975, abandoned. This application May 17, 1976, Ser. No. 686,727

Int. Cl.[2] C01B *17/50, 13/14;* **C04B** *11/02*

U.S. Cl. 423—541 R **8 Claims**



1. The continuous process of converting $CaSO_4$ to a solid CaO product and a gaseous SO_2 product by high temperature treatment of finely-divided $CaSO_4$ in a circulating fluidized bed of solid particles into which is introduced a hydrogen-containing carbonaceous fuel and air for combustion thereof to form in said bed a reducing gas containing CO and H_2, wherein the improvement comprises: maintaining a reducing zone in a lower portion of said fluidized bed by introducing a feed to

said reducing zone portion consisting essentially of said hydrogen-containing carbonaceous fuel and primary air, controlling the quantity of said primary air so that the reducing conditions in said lower reducing zone portion are effective to convert said $CaSO_4$ therein to a mixture of CaO and CaS, concurrently introducing secondary air into an upper portion of said bed above the level at which said fuel is introduced to provide an oxidizing zone within said bed capable of converting CaS to CaO, the solid particles of said bed during said treatment continuously circulating between and through said reducing and oxidizing zones, the total amount of O_2 supplied in said primary and secondary air plus the O_2 produced by calcium sulfate decomposition being at least equal to the stoichiometric quantity of O_2 required for complete combustion of the said fuel to CO_2 and H_2O, removing the CaO product from the upper portion of said bed, and removing the gaseous SO_2 product from above the bed substantially free of CO, H_2 and said fuel.

4,102,990

ELECTROPHORETIC ASSAY FOR ANTIGEN-ANTIBODY REACTION BASED ON PARTICLE-PARTICLE COUPLING

Egidijus E. Uzgiris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,420
Int. Cl.[2] G01N *27/26, 33/16*
U.S. Cl. 424—12 **8 Claims**

1. A method of detecting a reaction between antigenic protein molecules and antibody protein molecules, comprising:

preparing a first suspension of particles of high electrophoretic mobility with a first type of said protein molecules bonded thereto;

preparing a second suspension of particles of low electrophoretic mobility with said first type of protein molecules bonded thereto;

forming a mixture of said first and second suspensions in a solution to be tested for a second type of protein specific to said first type of protein on said particles; and

detecting electrophoretic mobility of particles intermediate said high and low electrophoretic mobilities as an indication that an antigen-antibody reaction has occurred.

4,102,991

PROCESS FOR CONTROLLING COCKROACHES AND OTHER CRAWLING INSECTS

Agis F. Kydonieus, New York, N.Y., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Filed Aug. 8, 1975, Ser. No. 603,052
Int. Cl.[2] A01N *17/12*
U.S. Cl. 424—27 **4 Claims**

1. A process for the control of cockroaches in structures comprising

deploying in the harborages and crawlpaths of the cockroaches a plurality of solid polymeric controlled release dispenser strips consisting essentially of

a barrier layer having on the first side thereof a pressure-sensitive adhesive and on the second side thereof

a polyvinyl chloride plastisol layer containing the insecticide propoxur and on the side thereof opposite said barrier layer,

a polyvinyl chloride layer, wherein

said controlled release is effected by molecular migration of said propoxur through and to the exposed surface of the polyvinyl chloride layer,

said strips have an insecticidally effective surface concentration of propoxur on said exposure surface,

said deploying of the strips is by means of said pressure-sensitive adhesive, and

the cumulative surface area of propoxur bearing surface of the strips is from about ½ to about 3 square feet per from about 100 to 150 square feet of floor area of the structure in which control of said cockroaches is sought.

4,102,992

DENTIFRICE

Walter Bryan Davis, Newdigate, England, assignor to Beecham Group Limited, England

Continuation-in-part of Ser. No. 541,423, Jan. 16, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,595
Claims priority, application United Kingdom, Feb. 8, 1974, 5983/74
Int. Cl.[2] A61K *7/16*
U.S. Cl. 424—49 **11 Claims**

1. A dentifrice toothpaste composition with minimum abrasion of tooth surface which contains as the cleaning agent 35–45% w/w of particulate coarse grade calcium carbonate weight median diameter 10–15 microns, which concentration otherwise adversely scratches dental enamel, and from 5–25% w/w of 40–100 micron organic thermoplastic water-insoluble particulate polymeric material having a Moh hardness of 3 or less in the form of particles which are not substantially agglomerated, which material is (a) less abrasive than and (b) of lower average density than the calcium carbonate and which reduces the scratch depth of the calcium carbonate on dental enamel.

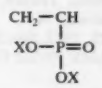
4,102,993

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,783
Int. Cl.[2] A61K *7/22*
U.S. Cl. 424—54 **17 Claims**

1. An oral composition comprising an oral vehicle, a nitrogen containing antibacterial antiplaque agent tending to stain dental surfaces selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms and a water soluble polymeric polyphosphonic compound antistain additive having the recurring group:



wherein X is selected from the group consisting of hydrogen and an orally acceptable cation and the unphosphonated recurring groups of said compound have a total molecular weight of at least about 3,500.

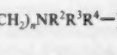
4,102,994

ALIPHATIC AMIDO-QUATERNARY AMMONIUM ANTI-MICROBIAL COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 445,713, Feb. 25, 1974, Pat. No. 4,046,873, which is a continuation-in-part of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application May 31, 1977, Ser. No. 801,975
Int. Cl.[2] A61K *7/22;* **C09F** *5/00, 7/00*
U.S. Cl. 424—54 **6 Claims**

1. A chemical compound having the structural formula:



wherein R is an aliphatic group containing 7–13 carbon atoms, R^2 and R^3 are independently a methyl or ethyl group, R^4 is an aliphatic chain containing 10–18 carbon atoms, *n* is the integer 2 or 3, and X is a compatible anion.

2. A chemical compound as set forth in claim 1, wherein R is a decane radical.

4,102,995

TAR GEL FORMULATION

Peter Hebborn, Clarence, N.Y., assignor to Westwood Pharmaceuticals Inc., Buffalo, N.Y.

Filed May 13, 1976, Ser. No. 685,844
Int. Cl.[2] A61K *31/78*
U.S. Cl. 424—81 **12 Claims**

1. A therapeutic aqueous gel composition suitable for treating skin comprising:

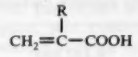
(a) from about 1 to about 10% by weight of an organic solvent extract of Crude Coal Tar;

(b) from about 25% to about 65% by weight of propylene glycol;

(c) from about 20% to 35% by weight of ethyl alcohol;

(d) from about 0.5% to about 5% by weight of a gelling agent; and

(e) from about 5% to 35% water; said gelling agent being a neutralized carboxyl interpolymer of a monomeric mono-olefinic acrylic acid of the structure:



where R is a substituent selected from the class consisting of hydrogen and lower alkyl groups, and from about 0.1 to about 10% by weight based on the total monomers of a monomeric polyether of an oligosaccharide in which the hydroxyl groups which are modified are etherified with allyl groups, said polyether containing at least two allyl ether groups per oligosaccharide molecule and said interpolymer having a molecular weight of the order of about 1,000,000.

4,102,996

METHOD OF PREPARING HEPATITIS B CORE ANTIGEN

William J. McAleer, Ambler; William J. Miller, North Wales, and Edward H. Wasmuth, Telford, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 20, 1977, Ser. No. 789,033
Int. Cl.[2] A61K *39/12*; C12K *7/00*
U.S. Cl. 424—89 **7 Claims**

1. A method of preparing hepatitis B core antigen which comprises treating Dane particles with a nonionic surfactant having from about 15 to about 35 oxyethylene units in the presence of a mercaptan reducing agent.

4,102,997

ACID DEGRADATION PRODUCTS OF BOROMYCIN

Irving Putter, Martinsville, and Lucille J. Cole, Roselle Park, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 22, 1976, Ser. No. 744,020
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—115 **6 Claims**

1. A mixture of boromycin acid degradation products prepared by the process comprising:

(a) treating boromycin or a salt of boromycin dissolved in a suitable solvent with approximately 10 equivalents of acid selected from the group consisting of mineral acids, aromatic sulfonic acids, Lewis acids and strong cation exchange resins for approximately 2 to 4 hours at about room temperature wherein said mineral acids are selected from the group consisting of sulfuric acid, nitric acid and hydrochloric acid; said aromatic sulfonic acids are selected from the group consisting of sulfosalicylic acid and p-toluenesulfonic acid; said Lewis acid is titanium tetrachloride and said strong cation exchange resin is a sulfonic acid resin in the hydrogen form having a styrenedivinylbenzene matrix;

(b) neutralizing the reaction solution by adjusting the pH to about neutral with inorganic base or neutralizing by passage through a column packed with a polystyrene amine anion exchange resin and concentrating the eluate in vacuo to a syrup containing the degradation products; and

(c) in the case wherein the reaction solution is neutralized with inorganic base, removing the precipitated salts by centrifugation and decanting and concentrating the supernatant in vacuo to a syrup.

4,102,998

PROCESS FOR THE PREVENTION OF VENEREAL DISEASE

Morton Gutnick, 8329 Fairview Rd., Elkins Park, Pa. 19117

Continuation-in-part of Ser. No. 621,958, Oct. 4, 1975, Pat. No. 3,996,933, and Ser. No. 515,574, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 294,200, Oct. 2, 1972, abandoned, said Ser. No. 621,958, is a continuation-in-part of Ser. No. 432,435, Jan. 11, 1975, abandoned, which is a continuation-in-part of said Ser. No. 294,200. This application Jul. 1, 1976, Ser. No. 701,889
Int. Cl.[2] A01N *9/00, 9/22, 9/24*; A01K *35/00*
U.S. Cl. 424—115 **15 Claims**

1. A process for preventing contraction of vaginal venereal disease by inhibiting or killing a venereal disease causing organism comprising the steps of:

inserting into the female genitalia tract a container containing a medication; and

substantially continuously releasing in the vagina said medication from said container in an amount and at a rate sufficient to establish and substantially continuously maintain a minimum inhibitory concentration of said medication such that the venereal disease causing organism entering the vagina will be inhibited or killed upon contact with said medication.

4,102,999

PROCESS FOR PRODUCING STABLE MACROMOMYCIN POWDER

Hamao Umezawa, and Tomio Takeuchi, both of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation of Ser. No. 653,873, Jan. 30, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,348
Claims priority, application Japan, Feb. 10, 1975, 50-17163
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—123 **15 Claims**

1. A process for producing stable macromomycin powder which comprises (a) forming a solution by mixing in an aqueous medium one part by weight of solid macromomycin and at least 10 parts by weight of a stabilizer selected from the group consisting of maltose, lactose, sucrose, cellobiose, melibiose and raffinose and (b) dehydrating the resulting solution to form a powder.

4,103,000

METHOD FOR PREPARING COPPER ARSENATE COMPOSITIONS

Winslow H. Hartford, Charlotte, N.C., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 331,126, Feb. 9, 1973, abandoned. This application May 23, 1974, Ser. No. 472,535
Int. Cl.[2] A01N *11/08*
U.S. Cl. 424—133 **4 Claims**

1. A method for making copper arsenate compositions which consist essentially of a slurry of water insoluble copper arsenate in an aqueous solution of soluble copper arsenate wherein the mole ratio of arsenic measured as As_2O_5 to copper measured as CuO of the overall copper arsenate composition is within the range of from about 0.3:1.0 to 0.9:1.0 and wherein the copper arsenate composition is soluble in chromic acid comprising reacting copper metal with arsenic acid in the presence of an oxidizing agent and an acid catalyst selected from the group consisting of nitric acid, hydrochloric acid and sulfuric acid wherein the copper and arsenic acid are propor-

tioned to produce a copper arsenate composition having a mole ratio of As_2O_5 to CuO of from about 0.3:1.0 to 0.9:1.0.

4,103,001

BUFFERED PHENOL-GLUTARALDEHYDE STERILIZING COMPOSITIONS

Robert I. Schattner, 4000 Massachusetts Ave., NW., Washington, D.C. 20007

Filed Aug. 30, 1976, Ser. No. 718,579
Int. Cl.[2] A01N *11/00, 9/00, 9/24, 9/26*
U.S. Cl. 424—148 **10 Claims**

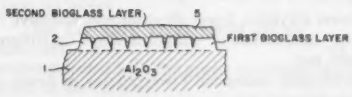
1. An aqueous sporicidal composition comprising by wt. from 0.75–4.0% glutaraldehyde and from 4–15% of a mixture of phenol and a metal phenate, the phenol content being from 3–10% and the metal phenate being from 0.5–5%, said composition further characterized in having a pH of about 7–10 and an active sterilizing life of at least 30 days.

4,103,002

BIOGLASS COATED A1203 CERAMICS

Larry Leroy Hench, and David Charles Greenspan, both of Gainesville, Fla., assignors to Board of Regents, University of Florida, Tallahassee, Fla.

Filed Feb. 8, 1977, Ser. No. 766,749
Int. Cl.[2] B32B *17/06, 31/24, 31/26*
U.S. Cl. 428—155 **20 Claims**



1. A method of coating a compacted Al_2O_3 ceramic surface with a biologically active glass, said ceramic and glass having different thermal coefficients of expansion, comprising:

(1) contacting said glass with said ceramic surface at a temperature and for a time sufficient to bond said glass to said ceramic surface by ion diffusion,

(2) cooling said coated substrate to a temperature sufficient to produce interconnected micro-cracks in said glass coating as a result of the thermo-mechanical stresses induced by the differential in thermal coefficients of expansion of said ceramic and glass, and

(3) overcoating said micro-cracked glass coating with at least one additional coating of biologically active glass.

14. A product of manufacture comprising a compacted Al_2O_3 ceramic surface coated with at least two layers of biologically active glass having a thermal coefficient of expansion different from that of said Al_2O_3 ceramic, said first layer being bonded to said ceramic surface through ion-diffusion and characterized by having interconnected thermo-mechanical stress induced micro-cracks therein, and said subsequent layer or layers being successively bonded thereover.

4,103,003

COMPOSITION FOR IMPROVING BIOLOGIC DEVELOPMENT

Harvey H. Ashmead, 719 E. Center St., Kaysville, Utah 84037

Continuation-in-part of Ser. No. 293,268, Sep. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 872,734, Oct. 30, 1969, abandoned. This application Apr. 26, 1976, Ser. No. 680,078
Int. Cl.[2] A61K *37/02, 31/70*
U.S. Cl. 424—177 **10 Claims**

1. A composition of matter for improving biological development by increasing the availability of essential polyvalent metals in readily assimilable form to the cells of an animal organism comprising effective amounts of (1) a metal chelate with ligands consisting of the polypeptides, peptides and naturally occurring amino acids and (2) a metal chelate with ligands consisting of hydrolyzed carbohydrates.

4,103,004

CARDIOTONIC AGENT

Ted R. Norton; Midori Kashiwagi, and Shoji Shibata, all of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed Aug. 29, 1977, Ser. No. 828,712
Int. Cl.[2] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **9 Claims**

1. A peptide designated anthopleurin-C having the amino acid sequence:

Gly-Val-Pro-Cys-Leu-Cys-Asp-Ser-Asp-Gly-Pro-Ser-Val-Arg-Gly-Asn-Thr-Leu-Ser-Gly-Ile-Leu-Trp-Leu-Ala-Gly-Cys-Pro-Ser-Gly-Trp-His-Asn-Cys-Lys-Ala-His-Gly-Pro-Thr-Ile-Gly-Trp-Cys-Cys-Lys-Gln.

4,103,005

NOVEL-ENKEPHALIN ANALOGS

Choh Hao Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 20, 1977, Ser. No. 843,778
Int. Cl.[2] A61K *37/00;* **C08L** *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **9 Claims**

1. A [Thz^5]-analog of enkephalinamide selected from [D-Met^2,Thz^5]-enkephalinamide and [D-Thr^2,Thz^5]-enkephalinamide.

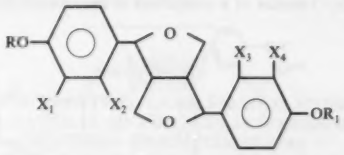
4,103,006

GLYCOSIDES OF 2,6-BIS(HYDROXY-PHENYL)-3,7-DIOXABICYCLO [3,3,0] OCTANE

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 20, 1976, Ser. No. 688,275
Int. Cl.[2] A61K *31/70;* **C07H** *15/00*
U.S. Cl. 424—181 **25 Claims**

23. A method of treating hypertension in a mammal comprising administering to said mammal an effective amount of pinoresinol glycoside of the formula



where R and R_1 are selected from the group consisting of hydrogen, a monosaccharide and a disaccharide, with at least one of R and R_1 being a monosaccharide or disaccharide, and X_1, X_2, X_3 and X_4 are each selected from the group consisting of hydrogen, lower alkyl, chlorine, amino and OR_2 where R_2 is hydrogen or lower alkyl, together with a pharmaceutical excipient.

4,103,007

PESTICIDAL SYNERGISTIC MIXTURE OF A DIOXATHIEPIN AND A FORMAMIDINE

Hartmut Joppien, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,593

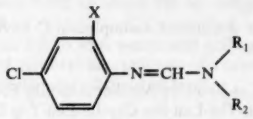
Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619834

Int. Cl.[2] A01N *9/12, 9/28*

U.S. Cl. 424—244 **14 Claims**

1. A pesticide of high insecticidal and acaricidal activity comprising, as active ingredients, a mixture of

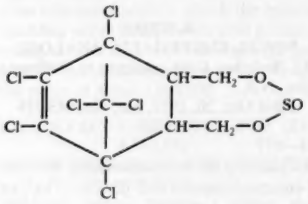
A. a formamidine derivative of the formula



in which R_1 is hydrogen or methyl R_2 is alkyl of 1 to 4 carbon atoms and X is hydrogen or methyl, or a salt thereof having insecticidal and acaricidal activity

with

B. A dioxathiepin of the formula



the ratio of compounds A and B being between about 200 : 1 and 1 : 5.

4,103,008

7[2(2,3 DIOXOPIPERAZIN-1-YL-CARBONYLAMINO)SUBSTITUTED 2 PHENYLACETAMIDO]-3-2'-THIADIAZOLYL CEPHALOSPORANIC ACID DERIVATIVES

Ishimaru Toshiyasu, D-14, 2-7, Momoyamadai, Suita; Hatanaka Minoru, 2-11-25, Tenjincho, Takatsuki; Hatamura Mariko, 4-34, Zuikodori, Higashiyodogawa-ku, Osaka, and Nitta Hazime, Towaso, 5-23-2, Izumicho, Suita, all of Japan

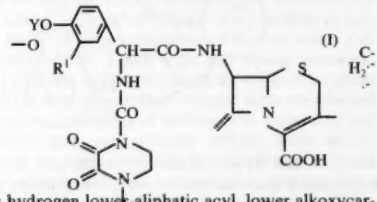
Filed Mar. 28, 1977, Ser. No. 781,834

Claims priority, application Japan, Apr. 7, 1976, 51-39549; Sep. 15, 1976, 51-111125

Int. Cl.[2] A61K *31/545;* **C07D** *501/36*

U.S. Cl. 424—246 **17 Claims**

1. A D(−)-isomer of a compound of the formula (I):



wherein Y is hydrogen lower aliphatic acyl, lower alkoxycarbonyl or acetylmethylcarbonyl, R^1 is hydrogen or halogen, R^2 is lower alkyl and R^3 is hydrogen or lower alkyl, and pharmaceutically acceptable salts thereof.

17. A pharmaceutical composition having antibacterial activity which comprises an effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,103,009

BENZOGUANAMINE DERIVATIVES

Hiromu Murai, Otsu; Katsuya Ohata, Uji; Yoshiaki Aoyagi, Kyoto; Fusao Ueda, Shiga; Masahiko Kitano, Kyoto, and Shinichi Tada, Joyo, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

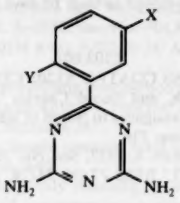
Filed Feb. 14, 1977, Ser. No. 768,091

Claims priority, application Japan, Mar. 29, 1976, 51-34948

Int. Cl.[2] C07D *251/48;* **A61K** *31/53*

U.S. Cl. 424—249 **14 Claims**

1. A compound selected from the group consisting of a benzoguanamine of the formula:



wherein

X is lower alkylthio, lower alkylsulfonyl, sulfamyl, N,N-di(-lower alkyl)sulfamyl, trifluoromethyl or trifluoromethylthio; and

Y is hydrogen, halogeno, lower alkoxy or lower alkoxy(-lower alkoxy), and

the pharmaceutically acceptable acid addition salts thereof.

13. The method of achieving an anti-ulcer effect in humans and other animals which comprises administering to a human or animal in need thereof an anti-ulcer effective amount of a compound according to claim 1.

4,103,010

(3-PIPERAZINOCARBONYLIMINO-QUANIDINO)-ISOXAZOLES

Jean-Jacques Sterne, Suresnes, France, assignor to Aron S.A.R.L., Suresnes, France

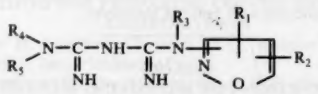
Continuation-in-part of Ser. No. 646,928, Jan. 6, 1976. This application Sep. 20, 1977, Ser. No. 834,976

Claims priority, application United Kingdom, Jan. 16, 1975, 1948/75

Int. Cl.[2] C07D *413/12*

U.S. Cl. 424—250 **11 Claims**

1. A compound selected from the group consisting of a compound having the formula:



(I)

in which:

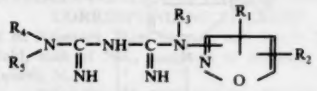
R_1 and R_2, which may be the same or different, are each selected from the group consisting of hydrogen, C_1 - C_6 alkyl and C_3 - C_6 cycloalkyl;

R_3 is selected from the group consisting of hydrogen and C_1 - C_4 alkyl;

R_4 and R_5, taken together with the nitrogen atom to which they are attached, are selected from the group consisting of piperazinyl and C_1 - C_4 alkyl piperazinyl, and a pharmaceutically acceptable acid addition salt thereof.

4. A therapeutic composition for regulation of the blood pressure comprising a therapeutically effective quantity of a

compound selected from the group consisting of a compound having the formula:



(I)

in which:

R_1 and R_2, which may be the same or different, are each selected from the group consisting of hydrogen, C_1 – C_6 alkyl and C_3 – C_6 cycloalkyl;

R_3 is selected from the group consisting of hydrogen and C_1 – C_4 alkyl;

R_4 and R_5, taken together with the nitrogen atom to which they are attached, are selected from the group consisting of piperazinyl and C_1 – C_4 alkyl piperazinyl, and a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

4,103,011

NOVEL PENICILLIN COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

Shinsaku Minami, Yamatokouriyama, and Yoshiyuki Takase, Amagasaki, both of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

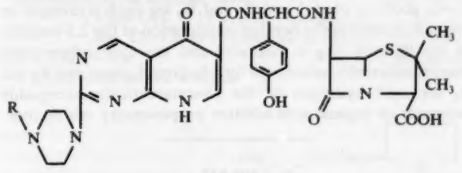
Filed Jun. 29, 1977, Ser. No. 811,445

Claims priority, application Japan, Jun. 30, 1976, 51-78085; Aug. 12, 1976, 51-96713

Int. Cl.[2] A61K *31/43;* **C07D** *499/68*

U.S. Cl. 424—251 **13 Claims**

1. A member selected from the group consisting of a penicillin compound of the formula



wherein R is a formyl or acetyl group, and a non-toxic pharmaceutically acceptable salt thereof.

4,103,012

INDOLIZINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS CONTAINING SAME

Jean Gubin, Brussels, and Gilbert Rosseels, Meise, both of Belgium, assignors to Labaz, Paris, France

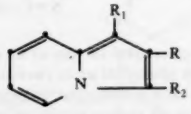
Filed Feb. 16, 1977, Ser. No. 769,332

Claims priority, application United Kingdom, Feb. 19, 1976, 06680/76; Aug. 10, 1976, 33314/76

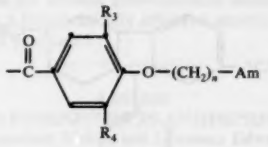
Int. Cl.[2] A61K *31/44;* **C07D** *221/22*

U.S. Cl. 424—263 **16 Claims**

1. An indolizine derivative corresponding to the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R represents a branched- or straight-chain alkyl radical having from 1 to 5 carbon atoms, phenyl, a mono-fluoro-, mono-chloro- or mono-bromo-phenyl, a di-fluoro-, di-chloro- or di-bromo-phenyl radical, a methoxy-phenyl radical or a methyl-phenyl radical optionally substituted on the aromatic moiety by an atom of fluorine, chlorine or bromine and R_1 and R_2, which are different, represent a hydrogen atom or a group of the formula:



wherein R_3 and R_4, which are identical, each represent a hydrogen atom or a methyl radical, Am represents dimethylamino, diethylamino, di-n-propylamino di-n-butylamino, and *n* is an integer in the range of from 2 to 6 inclusive.

4,103,013

SUBSTITUTED HYDROXY PYRIDONES

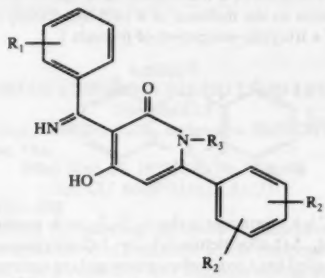
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 719,231, Aug. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,817, Oct. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 584,764, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 558,419, Mar. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,818

Int. Cl.[2] A61K *31/44;* **C07D** *213/44*

U.S. Cl. 424—263 **22 Claims**

1. A compound of the formula



where

R_1, R_2 and R_2' each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, lower alkoxy or trifluoromethyl, and

R_3 represents lower alkyl,

or a pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition for use in the treatment of tension which comprises a tranquilizing effective amount of a compound according to claim 1 and a pharmaceutically acceptable diluent or carrier therefor.

4,103,014

USE OF 4aRS,5SR,9bRS-2-ETHYL-1,3,4,4a,5,9b-HEXAHYDRO-7-METHYL-5-p-TOLYL-2H-INDENO[1,2-C]PYRIDINES IN INHIBITING SPERMATOGENESIS

Christian Hodel, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jul. 18, 1977, Ser. No. 817,418

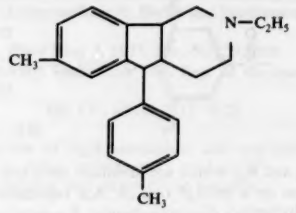
Claims priority, application United Kingdom, Jul. 16, 1976, 29691/76

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **6 Claims**

1. A method of inhibiting spermatogenesis in male animals, which comprises administering to a male animal in need of

such treatment a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt form thereof.

4,103,015

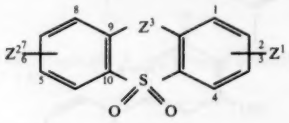
ANTIALLERGIC CYCLIC SULPHUR COMPOUNDS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 12, 1975, Ser. No. 586,427
Int. Cl.[2] A61K *31/41*
U.S. Cl. 424—269 **32 Claims**

1. A method of preventing the symptoms of allergic conditions consisting of asthma, allergic rhinitis, conjunctivitis, urticaria or eczema of a mammal in need thereof comprising administration to the mammal of a prophylactically effective amount of a tricyclic compound of formula I

(I)



wherein Z^1 is a substituent in the 1-, 2-, 3-, or 4- position and is 5-tetrazolyl, 5-(1-alkyl)tetrazolyl, or 5-(2-alkyl)tetrazolyl in which the alkyl has 1 to 6 carbon atoms and are each optionally substituted by hydroxyl; Z^2 is hydrogen when (a) Z^1 is in the 1-, 2-, or 4-position and has the same meaning as above and (b) when Z^1 is in the 3-position and is 5-(1-alkyl)tetrazolyl or 5-(2-alkyl)tetrazolyl in which the alkyl has 1 to 6 carbon atoms and are each optionally substituted by a hydroxyl or carboxyl; or Z^2 is a substituent in the 5-, 6-, 7-, or 8-position selected from the group consisting of Z^1 as defined above, carboxyl, alkylsulphonyl, alkylsulphinyl, thioalkyl, amino, nitro, cyano, halogen, alkyl or alkoxy wherein the "alkyl" moiety of each of the alkyl, alkoxy, thioalkyl, alkylsulphinyl and alkylsulphonyl has 1 to 6 carbon atoms; and Z^3 is carbonyl; or a pharmaceutically acceptable salt thereof.

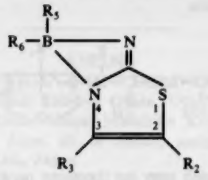
4,103,016

ANTIINFLAMMATORY IMIDAZOTHIAZOLES AND THIAZOLOPYRIMIDINES

Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

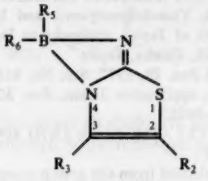
Continuation-in-part of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Dec. 22, 1976, Ser. No. 753,350
Int. Cl.[2] A61K *31/425;* C07D *277/00*
U.S. Cl. 424—270 **10 Claims**

1. A compound of the formula



wherein B is 1',2'-cyclohexylene, R_2 is hydrogen and R_3 is C_1–C_4 alkyl or phenyl and R_5 and R_6 are each hydrogen or when R_3 is methyl the bond of unsaturation at the 2,3-position of the thiazole ring is saturated and the C-3 carbon atom thereof optionally substituted by a hydroxyl group and R_5 and R_6 are each hydrogen or the pharmaceutically acceptable inorganic or organic acid addition or quaternary salt thereof.

7. A method of preventing and inhibiting the formation of granuloma tissue in an animal subject, which method comprises administering to said animal a nontoxic antiinflammatory amount of a compound of the formula



wherein B is 1',2'-cyclohexylene, R_2 is hydrogen and R_3 is C_1–C_4 alkyl or phenyl and R_5 and R_6 are each hydrogen or when R_3 is methyl the bond of unsaturation at the 2,3-position of the thiazole ring is saturated and the C-3 carbon atom thereof optionally substituted by a hydroxyl group and R_5 and R_6 are each hydrogen or the pharmaceutically acceptable inorganic or organic acid addition or quaternary salt thereof.

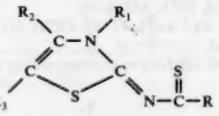
4,103,017

PESTICIDAL 2-IMINOTHIAZOLINE DERIVATIVES

John H. Davies, Boughton; Jack Wood, and Michael Pearson, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 8, 1977, Ser. No. 775,500
Claims priority, application United Kingdom, Mar. 9, 1976, 9335/76
Int. Cl.[2] C07D *277/18;* A61K *31/425*
U.S. Cl. 424—270 **3 Claims**

1. A 2-iminothiazoline derivative of the formula:



wherein R is hydrogen, alkyl of one to six carbon atoms, or phenyl; R_1 is alkyl or alkenyl of up to twelve carbon atoms, or is benzyl; R_2 and R_3 each is hydrogen, chlorine, bromine, alkyl or alkylthio of one to six carbon atoms, or is phenyl.

2. A method for killing insects and acarids which comprises subjecting them to an effective amount of a compound of claim 1.

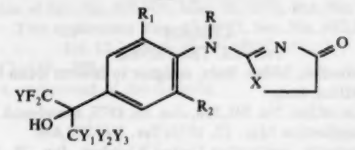
3. A composition adapted to killing insects and acarids which comprises an effective amount of a compound of claim 1 together with a carrier, optionally containing in addition thereto a surface-active agent.

4,103,018
2-[4-(POLYHALO-2-HYDROXY-2-PROPYL)ANILINO]-2-OXAZOLIN-4-ONES AND THIAZOLIN-4-ONES CORRESPONDING THERETO

Bernard R. Neustadt, West Orange, and Nicola Zampaglione, Fairfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 12, 1976, Ser. No. 731,236
Int. Cl.[2] C07D *263/40;* A61K *31/42*
U.S. Cl. 424—272 **10 Claims**

1. A compound of the formula



(I)

wherein X is oxygen; R is hydrogen or lower alkyl; R_1 and R_2 are independently hydrogen, lower alkyl, lower alkoxy or halogen; and Y, Y_1, Y_2 and Y_3 are independently hydrogen, chlorine or fluorine.

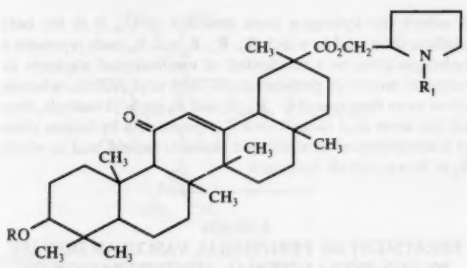
7. A pharmaceutical composition in unit dosage form adapted for oral administration for the treatment of hypertension which comprises, per dosage unit, a quantity to obtain an antihypertensive effect of a compound of claim 1 together with a pharmaceutical carrier compatible with said compound.

4,103,019
TRITERPENE DERIVATIVES

Jose E. Acosta Mira, Madrid, Spain, assignor to Laboratorios Landerlan, S. A., Madrid, Spain

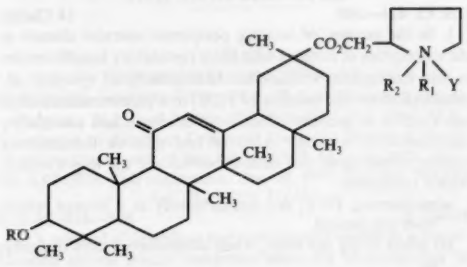
Filed Oct. 7, 1975, Ser. No. 620,417
Int. Cl.[2] C07D *207/08;* A61K *31/40*
U.S. Cl. 424—274 **11 Claims**

1. Compounds of the formula



wherein R is hydrogen or a carboxylic acyl group of 2 to 20 carbon atoms and R_1 is a lower alkyl group.

2. Compounds of the formula



wherein R is hydrogen or a carboxylic acyl group of 2 to 20 carbon atoms, R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms and Y is a pharmaceutically acceptable anion.

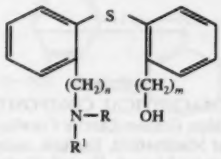
6. A process for treating gastroduodenal ulcers comprising administering a therapeutically effective amount of the compound defined by claim 1.

4,103,020
SULFIDE COMPOUNDS AS ANTIDEPRESSANTS

Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, Jul. 21, 1975, Pat. No. 3,997,540.
This application Sep. 24, 1976, Ser. No. 726,489
Int. Cl.[2] A61K *31/40;* C07D *207/12, 207/24*
U.S. Cl. 424—274 **12 Claims**

6. The method of treating depression is in a mammal which comprises administering to a depressed mammal an effective antidepressant amount of a compound of the formula



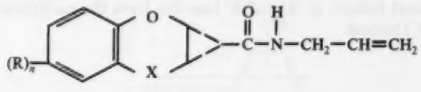
or a pharmaceutically acid addition salt thereof where R and R^1 taken together are $(CH_2)_X$ whee X is 4 and *n* and *m* are the same or different and are each 1, 2 or 3.

4,103,021
METHOD OF LOWERING BLOOD LIPID LEVELS IN MAMMALS

John B. Carr, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1977, Ser. No. 779,648
Int. Cl.[2] A61K *31/335, 31/35*
U.S. Cl. 424—278 **1 Claim**

1. A method for reducing the levels of cholesterol and triglycerides in the blood of a mammal which comprises administering orally or parenterally to a mammal having an elevated blood cholesterol level, or an elevated blood triglyceride level, or both, an effective amount of a compound of the formula:



(I)

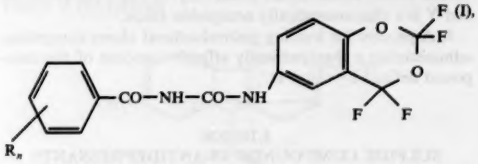
wherein *n* is zero or one, R is lower halogen, and X is —O— or $—CH_2—$.

4,103,022
COMBATING ARTHROPODS WITH 3-(2,2,4,4-TETRAFLUORO-BENZ-1,3-DIOXIN-6-YL)-1-(SUBSTITUTED BENZOYL)-UREAS

Wilhelm Sirrenberg, Sprockhoevel; Hans-Ulrich Alles, Odenthal-Blecher; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 821,445
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637947
Int. Cl.[2] A01N *9/28;* C07D *319/08*
U.S. Cl. 424—278 **10 Claims**

1. A 3-(2,2,4,4-tetrafluoro-benz-1,3-dioxin-6-yl)-1-benzoylurea of the formula



in which

R is halogen, alkyl or nitro, and

n is 1, 2, 3, 4 or 5.

8. An anthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,103,023

PHARMACEUTICAL COMPOSITIONS

David Cecil Aldridge; Graham Charles Crawley, and Colin John Strawson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

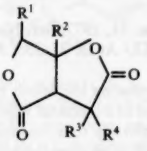
Continuation-in-part of Ser. No. 612,531, Sep. 11, 1975, Pat. No. 4,032,651. This application Mar. 24, 1977, Ser. No. 780,991

Claims priority, application United Kingdom, Sep. 27, 1974, 42040/70

Int. Cl.[2] C07D *493/04*

U.S. Cl. 424—279 **6 Claims**

1. A 3,3a,6,6a-tetrahydrofuro[3,4-b]furan-2,4-dione having the formula:-



wherein R^1 is a phenyl radical, R^2 is hydrogen, R^3 is hydrogen or a $C_{1\text{-}10}$-alkyl radical, and R^4 is hydrogen or a $C_{2\text{-}10}$-alkoxycarbonyl radical, or R^3 and R^4 together form the methylene ($=CH_2$) radical.

4,103,024

NEMATICIDALLY AND ARTHROPODICALLY ACTIVE N-METHYL-N-(2-TOLUENESULPHONIC ACID METHYLAMIDE-N'-SULPHENYL)-2,2-DIMETHYL-2,3-DIHYDROBENZOFURANYL-(7)-CARBAMATE

Peter Siegle, Cologne; Engelbert Kühle, Berg.-Gladbach; Alfons Hartmann, Beckingen; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

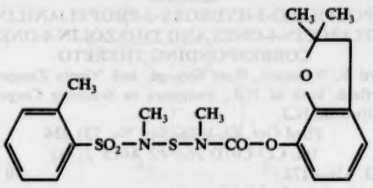
Filed Feb. 28, 1977, Ser. No. 773,108

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609830

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—285 **3 Claims**

1. N-Methyl-N-(2-toluenesulphonic acid methylamide-N'-sulphenyl)-2,2-dimethyl-2,3-dihydrobenzofuranyl-(7)-carbamate, of the formula



4,103,025

NOVEL TERPENES

Giuseppe Mustich, Milan, Italy, assignor to Inverni Della Beffa S.p.A., Milan, Italy

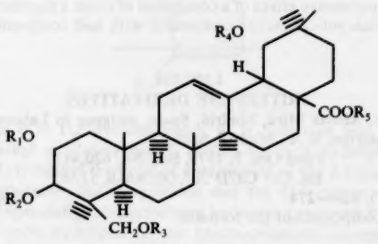
Continuation of Ser. No. 541,588, Jan. 16, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,458

Claims priority, application United Kingdom, Jan. 29, 1974, 4042/74

Int. Cl.[2] A61K *31/215, 31/22;* C07C *69/74, 69/78*

U.S. Cl. 424—305 **46 Claims**

1. A derivative of sericic acid, having anti-inflammatory and cicatrizing properties, comprising a compound of the general formula



in which the hydrogen atom attached to C_{18} is in the beta configuration, and in which R_1, R_2, R_3 and R_4 each represent a hydrogen atom or a substituted or unsubstituted aliphatic or aromatic mono- or polycarboxylic acid acyl radical, wherein when more than one of R_1, R_2, R_3 and R_4 are acyl radicals, they are the same acyl radical, and R_5 represents a hydrogen atom or a substituted or unsubstituted aliphatic radical, and in which R_1 to R_5 are not all hydrogen.

4,103,026

TREATMENT OF PERIPHERAL VASCULAR DISEASE BY NON-INTRAARTERIAL ADMINISTRATION OF PROSTAGLANDIN E_1

Lars A. Carlson, Stora Malmgatan 19 S-190 30, Sigtuna, Sweden

Continuation-in-part of Ser. No. 716,737, Aug. 23, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,175

Int. Cl.[2] A61K *31/215, 31/19*

U.S. Cl. 424—305 **14 Claims**

1. In the method of treating peripheral vascular disease in the extremities of humans who have circulatory insufficiencies in said extremities; which consists essentially of systemic administration to said humans of PGE_1 in a pharmaceutical dosage form in an amount effective to decrease said circulatory insufficiencies, whereby relief of rest pain or induction of healing of ulcers in said extremities occurs; the improvement which comprises:

administering PGE_1 non-intraarterially in a dosage which does not exceed

(a) about 10 μg per hour, when administered intravenously; or

(b) the dosage by any other route which is equivalent to a 10

μg per hour dose intravenously, when administered by said other route.

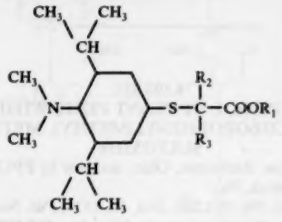
4,103,027

AMINO SUBSTITUTED ARYLTHIO-ALKANOIC ACIDS HAVING HYPOLIPIDEMIC ACTIVITY

Eugene R. Wagner, Midland, and Bobbie J. Allen, Detroit, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 671,909, Mar. 29, 1976, Pat. No. 4,062,975. This application Aug. 12, 1977, Ser. No. 823,299
Int. Cl.[2] A61K *31/24*; C07C *149/43*
U.S. Cl. 424—309 4 Claims

1. A compound of the formula:

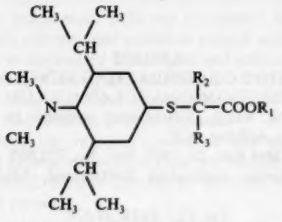


wherein

R_1 represents a lower alkyl having from 1 to about 5 carbon atoms

and R_2 and R_3 independently represent hydrogen or an alkyl having from 1 to about 10 carbon atoms.

3. A method for lowering elevated serum lipids in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound having the formula:



wherein

R_1 represents a lower alkyl having from 1 to about 5 carbon atoms

and R_2 and R_3 independently represent hydrogen or an alkyl having from 1 to about 10 carbon atoms.

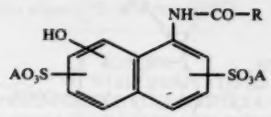
4,103,028

COMPLEMENT INHIBITORS

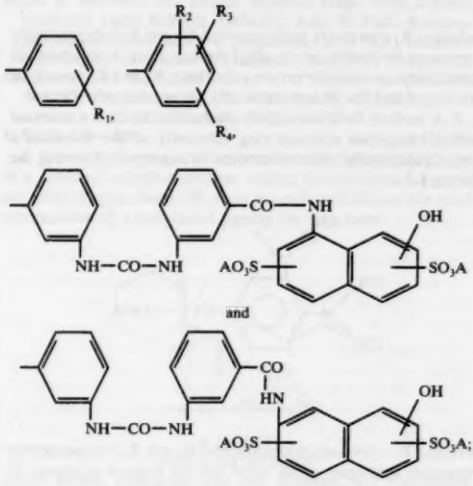
Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Milton David Heller, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 684,598, May 10, 1976, Pat. No. 4,046,805. This application Mar. 25, 1977, Ser. No. 781,235
Int. Cl.[2] A61K *31/185*
U.S. Cl. 424—315 16 Claims

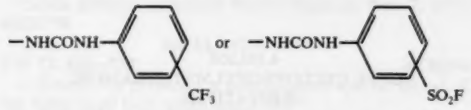
1. A method of inhibiting the complement system in a warm-blooded animal which comprises internally administering to said animal an effective cor.plement inhibiting amount of a compound of the formula:



wherein R is selected from the group consisting essentially of

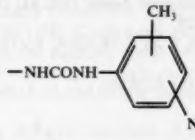


R_1 is



R_2 is hydrogen or $-CH_3$; R_3 is hydrogen, $-NO_2$, $-NH_2$, or $-CH_3$;

R_4 is hydrogen, $-NO_2$, $-NH_2$, $-CH_3$ or



and A is hydrogen, alkali metal or alkaline earth with the proviso that each A is identical in the same compound.

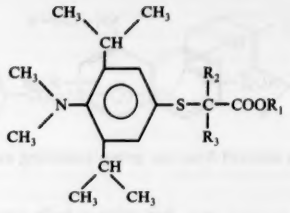
4,103,029

AMINO SUBSTITUTED ARYLTHIO-ALKANOIC ACIDS HAVING HYPOLIPIDEMIC ACTIVITY

Eugene R. Wagner, Midland, and Bobbie J. Allen, Detroit, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

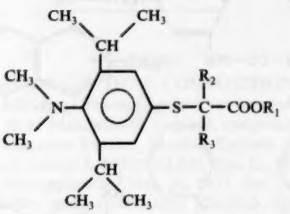
Division of Ser. No. 671,909, Mar. 29, 1976, Pat. No. 4,062,975. This application Aug. 10, 1977, Ser. No. 823,298
Int. Cl.[2] A61K *31/20*; C07C *149/43*
U.S. Cl. 424—318 4 Claims

1. A compound of the formula



wherein R_1 represents hydrogen and R_2 and R_3 independently represent hydrogen or an alkyl having from 6 to about 10 carbon atoms with the proviso that both R_2 and R_3 cannot be hydrogen and the pharmaceutically acceptable salts thereof.

3. A method for lowering elevated serum lipids in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound having the formula



wherein R_1 represents hydrogen and R_2 and R_3 independently represent hydrogen or an alkyl having from 6 to about 10 carbon atoms with the proviso that both R_2 and R_3 cannot be hydrogen and the pharmaceutically acceptable salts thereof.

4,103,030

NOVEL CYCLOPROPYLMETHYLAMINE DERIVATIVES

Atsuyuki Kojima, Nishinomiya; Yoshito Kameno, Minoo; Junki Katsube, Toyonaka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

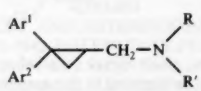
Filed Nov. 26, 1975, Ser. No. 635,331

Claims priority, application Japan, Dec. 11, 1974, 49-142899; May 16, 1975, 50-58929

Int. Cl.[2] A01N *9/20, 9/24;* **C07C** *91/16, 91/28*

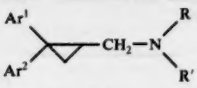
U.S. Cl. 424—330 **6 Claims**

1. A compound of the formula:



wherein Ar^1 represents a phenyl group having one or more substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl, said substituents being present at the o- or m-positions, Ar^2 represents an unsubstituted phenyl group or a phenyl group substituted with one or more substituents selected from the group consisting of halogen and C_1–C_4 alkyl, R represents hydrogen, C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl and R′ represents C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl, or a non-toxic salt thereof.

5. A pharmaceutical composition comprising as an active ingredient an effective antidepressant or anorexic amount of at least one of the compounds of the formula:



wherein Ar^1 represents a phenyl group having one or more substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl, said substituents being present at the o- or m-positions, Ar^2 represents an unsubstituted phenyl group or a phenyl group substituted with one or more substituents selected from the group consisting of halogen and C_1–C_4 alkyl, R represents hydrogen, C_1–C_4 alkyl or C_2–C_4 hydroxy-alkyl and R′ represents C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl, or a non-toxic salt thereof, with at least one pharmaceutically acceptable inert carrier or diluent.

4,103,031

CONTROL OF PLANT PESTS WITH BIS(4-CHLOROPHENYL)METHYL METHYL SULFOXIDE

George G. Ecke, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 701,383, Jun. 30, 1976, Pat. No. 4,064,178, which is a continuation-in-part of Ser. No. 578,598, May 19, 1975, abandoned. This application Dec. 9, 1977, Ser. No. 858,993

Int. Cl.[2] A01N *9/14*

U.S. Cl. 424—337 **11 Claims**

1. A method of controlling plant pests of the genera Epilichona, Spodoptera, Phytophthora, Fusarium, or Xanthomonas, upon plants which comprises:

contacting the plant with bis(4-chlorophenyl)methyl methyl sulfoxide in a pesticidally effective amount.

4,103,032

METHOD OF COMBATTING FUNGI AND *PSEUDOMONAS SOLANACERUM*

Saleem Farooq, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 25, 1977, Ser. No. 771,865

Claims priority, application Switzerland, Mar. 4, 1976, 2700/76

Int. Cl.[2] A61K *31/09*

U.S. Cl. 424—341 **2 Claims**

1. A method for combatting Pseudomonas solanacearum on growing plants comprising applying thereto a bactericidally effective amount of 4-isobornyloxy-allyloxybenzene.

4,103,033

METHOD OF CONTROLLING INSECTS

Victor M. Thomas, Jr., San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 19, 1977, Ser. No. 760,785

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—343 **1 Claim**

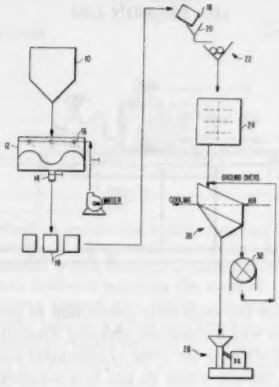
1. A method for controlling the growth of insects selected from *Oncopeltus fasciatus* or *Trichloplusia ni* at a pre-adult stage of the life cycle which comprises applying to the locus where such control is desired, an insecticidally effective amount of 2-bromo-8-chloro-1,1,9-trimethyl-4-methylene-spiro[5.5]undec-8-en-3-ol.

4,103,034

PROCESS FOR PRODUCTION OF TEXTURED PROTEIN FLAKES

Kenneth S. Ronai, Ridgewood; Henry C. Spanier, Ramsey; Felice Scaglione, Lodi, and Edward F. Wisniewski, Roselle, all of N.J., assignors to Nabisco, Inc., New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,136
Int. Cl.[2] A23J *3/00;* A23L *1/27*
U.S. Cl. 426—250 21 Claims



21. A method for preparing dried, flaked, textured, high protein material which instantly hydrates, has a protein content of 30 percent or more, and has an improved flavor which comprises:

(i) texturizing protein material selected from the class consisting essentially of deoiled vegetable protein material, animal protein material and fish protein material by subjecting said protein material containing moisture to a pressure of at least 1,800 pounds per square inch for a time and at a temperature sufficient to convert said moisture into steam whereby said protein is toasted without scorching, and is compacted into a hard and substantially fused mass having textured characteristics;

(ii) fragmenting said fused mass into particles;

(iii) sizing said textured protein material,

(iv) increasing the moisture content of and tempering said textured protein material to raise the moisture content of said textured protein material to between about 12 and about 25 percent;

(v) flaking said textured protein material; and

(vi) drying said flaked textured protein material.

4,103,035

METHOD FOR RETAINING SOFTNESS IN RAISINS

Charles V. Fulger, Battle Creek, Mich., and Thomas D. Morfee, Gig Harbor, Wash., assignors to Kellogg Company, Battle Creek, Mich.

Continuation-in-part of Ser. No. 171,011, Aug. 11, 1971, abandoned. This application Jul. 11, 1973, Ser. No. 378,124
Claims priority, application United Kingdom, Aug. 10, 1972, 37270/72
Int. Cl.[2] A23B *7/08, 7/14*
U.S. Cl. 426—321 17 Claims

1. The method for improving softness retention characteristics of whole dried fruits having an essentially intact surface skin which comprises first contacting the surface skin of said dried fruits with a hot, weak acid solution for a period of time to cause said fruits to become more acceptable to subsequent humectant absorption, and then, as a separate step, contacting the skin of said dried fruits with an edible polyalcohol humectant until in excess of 3% humectant has been absorbed by said fruit, and thereafter drying the treated fruit to a moisture content of from about 12% to about 20%.

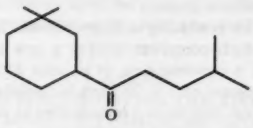
4,103,036

FLAVORING WITH DERIVATIVES OF 1-ACETYL-3,3-DIMETHYLCYCLOHEXANE, AND PROCESSES FOR USING SAME AND PROCESSES FOR PREPARING SAID 1-ACETYL-3,3-DIMETHYLCYCLOHEXANE DERIVATIVES

Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust; Frederick Louis Schmitt, Holmdel; John B. Hall, Rumson, and James Milton Sanders, Eatontown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 713,357, Aug. 11, 1976, Pat. No. 4,062,894. This application Jul. 28, 1977, Ser. No. 819,955
Int. Cl.[2] A23L *1/226, 1/235*
U.S. Cl. 426—538 2 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff which comprises adding thereto from 0.5 parts per million up to about 100 parts per million based on the total composition of a compound having the structure:



4,103,037

LOW FAT SPREAD

Janos Bodor, Voorburg; Jan van Heteren, and Laurentius Adrianus Maria Verhagen, both of Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,933
Claims priority, application United Kingdom, Nov. 7, 1975, 46215/75
Int. Cl.[2] A23L *1/04*
U.S. Cl. 426—575 4 Claims

1. Process for preparing a proteinaceous low fat spread of the water-in-oil type which comprises:

(i) preparing a proteinaceous substantially neutral aqueous medium which is substantially free from undissolved protein particles of an average major dimension of more than 5 microns.

(ii) dissolving a gelling agent of a melting point of 25°–35° C in a substantially protein-free aqueous medium of a temperature of 60°–100° C and a pH value of 1–7.

(iii) combining the aqueous media obtained to obtain an aqueous phase having a weight ratio of proteins: gelling agent of (1–6):(8–1), and optionally adjusting the pH value to 3.0–6.8.

(iv) dispersing the aqueous phase of a temperature of no more than 40° C in a fatty phase of a hardness value at 5° C of 100–3000 g/cm^2.

(v) passing the mixture through one or more cooled surface scraped heat-exchangers and resting tubes.

4,103,038

EGG REPLACER COMPOSITION AND METHOD OF PRODUCTION

W. L. Roberts, Mequon, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Sep. 24, 1976, Ser. No. 726,187
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—601 22 Claims

1. An egg replacer composition which is low in cholesterol, high in the ratio of polyunsaturated fats to saturated fats, avidin free and which is heat settable or coagulable, comprising:

(a) from 30 to 75% by weight of ultrafiltered whey protein;
(b) from 5 to 65% by weight of fats having a polyunsaturated to saturated ratio of 1:1 to 2.8:1, and
(c) from 0.2 to 17.0% by weight of a food grade emulsifier; and wherein the cholesterol content is less than 0.5 mg. per gram of composition.

4,103,039

METHOD FOR PRODUCING IMPROVED SHEA FAT

Akio Mandai, Izumiotsu; Yoshinori Hirukawa, Sennan; Hayato Kubota, Izumi, and Yukiya Iwanaga, Sennan, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Aug. 18, 1976, Ser. No. 715,669
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—607 5 Claims

1. A method for producing an improved shea fat suitable for hard butter, which comprises heating a raw shea fat with ethanol having a concentration of at least 85% by weight ethanol in an amount of 1 to 20 parts by weight to 1 part by weight of the raw shea fat to a temperature to provide a mixture consisting of an alcohol insoluble portion and an alcohol soluble portion allowing the mixture to stand at the temperature of said heating for a time sufficient to allow the alcohol insoluble portion to separate, removing the alcohol-insoluble portion from the mixture at said temperature of heating, cooling the remaining solution to a temperature of 20° to 60° C, thereby causing said solution to separate into two separate and distinct liquid layers, the upper layer being oil-poor and the lower layer being oil-rich, and collecting the latter oil-rich layer.

4,103,040

LOW CHOLESTEROL EGG PRODUCT AND PROCESS

Joseph A. Fioriti, Hastings-on-Hudson; Howard D. Stahl, Tarrytown; Rex J. Sims, Pleasantville, all of N.Y., and Clifford H. Spotholz, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 888,608, Dec. 29, 1967, Pat. No. 3,717,474.
This application Nov. 16, 1972, Ser. No. 307,309
Int. Cl.[2] A23L *1/32*
U.S. Cl. 426—614 2 Claims

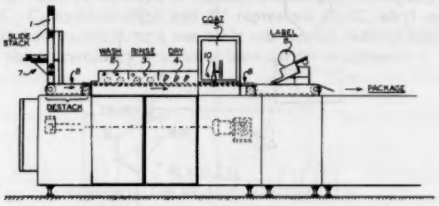
1. A process of producing a low cholesterol egg product which resembles the unmixed contents of a natural egg comprising:
cooling to a plastic condition the wet egg yolk of a product obtained from natural egg yolk and wherein the natural water content of the natural egg yolk is substantially retained and wherein the egg yolk has a ratio of polyunsaturated fat content to saturated fat content equal to or greater than 1, and a cholesterol content lower than that of natural egg yolk, and
forming said yolk into a round shape, and combining the thus formed yolk with liquid egg white.

4,103,041

PROCESS FOR COATING SLIDES

Heinz Macho, Mannheim-Neuostheim; Hans Lange, Lampertheim; Dieter Berger, Viernheim, and Wolfgang Werner, Mannheim-Vogelstang, all of Germany, assignors to Boehringer Mannsheim GmbH, Mannheim, Germany

Filed Mar. 31, 1976, Ser. No. 672,574
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515869
Int. Cl.[2] A01N *1/02*
U.S. Cl. 427—2 6 Claims



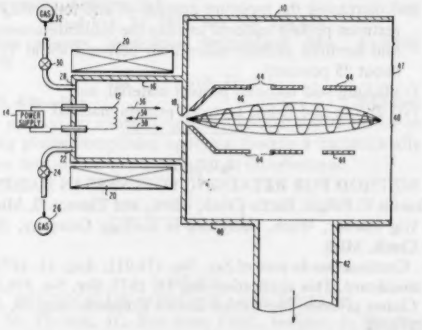
1. Process for the large-scale production of pre-coated microscope slides which comprises spraying dyestuff solution on to microscope slides in the form of individual microfine dyestuff droplets thereon which do not flow together.

4,103,042

HOT FILAMENT, ARC TYPE ION SOURCE AND METHOD

Harold Franklin Winters, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 631,986, Nov. 14, 1975, abandoned.
This application Mar. 2, 1977, Ser. No. 773,464
Int. Cl.[2] B32B *35/00*; C23C *11/10*
U.S. Cl. 427—38 6 Claims



1. A method of extending the lifetime of a hot filament in an arc type ion source device of the type wherein said hot filament is exposed to ion bombardment during operation of said device comprising the steps of:
providing said hot filament with a carburized surface layer; and
revitalizing said carburized layer by exposing said hot filament to a carbon containing gas while said hot filament is subjected to ion bombardment from said device.

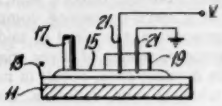
4,103,043
THERMOGRAPHIC PRINTING METHOD

Paul Y. Hsieh, Ridgewood, N.J., and Eugene W. Rogall, Huntington Station, N.Y., assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Division of Ser. No. 655,795, Feb. 6, 1976, Pat. No. 4,017,366, which is a continuation of Ser. No. 454,653, Mar. 25, 1974, abandoned, which is a continuation of Ser. No. 323,583, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 64,395, Aug. 17, 1970, abandoned. This application Sep. 22, 1976, Ser. No. 725,812

Int. Cl.² B05D *3/14*

U.S. Cl. 427—49 **1 Claim**



1. A method of producing visible printing on a receiving medium coated with a heat-sensitive coating including thermographic materials which undergo a chemical colored marking reaction when heated comprising the steps of:

superimposing immediately before printing an electrically conductive path on a given portion of the coated medium by dispensing a liquid electrolyte on said given portion;

contacting the superimposed liquid electrolyte with at least one pair of closely spaced electrodes made of material electrolytically non-corrodable by said liquid electrolyte; and

applying an electrical potential difference across the pair of electrodes to effect a current to pass therebetween and only through the liquid electrolyte to heat the superimposed liquid electrolyte to a temperature higher than the temperature required to trigger the reaction of the thermographic materials, said heating causing a chemical reaction to effect a change in color in the given portion of the coated medium.

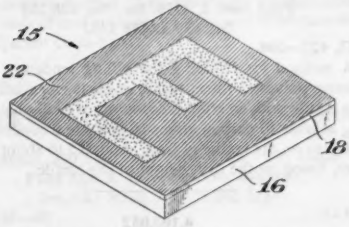
4,103,044
METHOD FOR STORAGE OF RETRIEVABLE INFORMATION DISPERSION IMAGING MATERIAL AND METHOD

Adi Eisenberg, Montreal, Canada, and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Energy Conversion Systems, Inc., Troy, Mich.

Division of Ser. No. 227,962, Feb. 22, 1972, abandoned. This application Nov. 26, 1976, Ser. No. 745,455

Int. Cl. G03g *13/00*

U.S. Cl. 427—56 **4 Claims**



1. A method of storing and retrieving information comprising the steps of (1) providing an imaging structure consisting essentially of an electromagnetic energy transmissive or reflective substrate having adhered on a surface thereof a continuous, opaque layer of mechanically flattened small, individual particles formed of a cross-linked organic polymeric material having a memory for a physical shape which normally is different from the mechanically flattened condition of said particles on the surface of the substrate, said particles being present on said surface of the substrate in a quantity to provide at least a single, continuous, opaque layer of said particles in their mechanically flattened condition on said surface and being characterized in that they are capable upon being subjected to imaging energy above a certain threshold of changing their physical shape from a flattened condition to a shape which will provide in the imaging structure an information retrievable characteristic determined at least in part by particles of cross-linked organic polymeric material in said layer which have undergone a change in physical shape due to exposure to imaging energy above a certain threshold and particles in said layer of the material which have not been exposed to imaging energy above said certain threshold and which have not as a result thereof undergone a change in physical shape from their original mechanically flattened condition, (2) applying imaging energy above said certain threshold

in a preselected pattern to the layer of flattened particles of cross-linked organic polymeric material to effect a change in physical shape in the particles comprising said layer in the areas thereof corresponding to said pattern of image energy and (3) detecting the change in condition of the layer of particles of cross-linked organic polymeric material due to the change in physical shape of the imaging energy exposed particles in the layer by directing electromagnetic energy upon the imaging structure to determine visually or otherwise the change in said layer.

4,103,045
PROCESS FOR IMPROVING THE ADHESION OF COATINGS MADE OF PHOTORESISTANT POLYMERS TO SURFACES OF INORGANIC OXIDES

Andre Lesaicherre, Lesigny, and Louis Linguenheld, St. Genis Laval, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 383,507, Jul. 30, 1973, Pat. No. 3,911,169. This application Mar. 6, 1975, Ser. No. 555,889

Claims priority, application France, Jul. 31, 1972, 72.27581; May 7, 1973, 73.16286

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.² B05D *5/10, 5/12*

U.S. Cl. 427—82 **5 Claims**

1. A process for bonding a photoresistant polymer to a layer of inorganic oxides, wherein prior to the deposition of the polymer on the oxide layer, the layer is treated with an organosilicon compound having silicon-nitrogen bonds which is a polysilazane of the formula

$R_3SiNH(R_2SiNH)_{p'}SiR_3$ in which p' is zero or a number from 1 to 15, and each R group may independently represent methyl, phenyl, or ethoxy, at least one of the symbols R representing a methoxy group when p' is zero.

4,103,046
METHOD OF IMPREGNATING CARBON ELECTRODES

Toru Taniguchi, Kyoto, Japan, assignor to Nikku Industry Co., Ltd., Itami and Nippon Carbon Co., Ltd., Tokyo, both of, Japan

Filed Nov. 16, 1976, Ser. No. 742,084

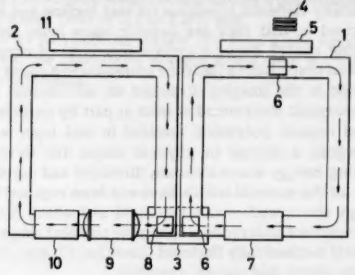
Claims priority, application Japan, Nov. 29, 1975, 50-143241

Int. Cl.² C25B *11/14*

U.S. Cl. 427—113 **1 Claim**

1. A method of impregnating carbon electrodes with pitch comprising the steps of (1) loading pre-sintered and burned electrodes onto a first palette means; (2) passing said electrodes and first palette means along a first palette transporting course; (3) heating and drying said electrodes as they pass along said first palette transporting course; (4) transferring the electrodes from (3) to a second palette means; (5) passing said electrodes and second palette means along a second palette transporting course; (6) impregnating the electrodes with pitch as they pass along said second palette transporting course; (7) quenching the impregnated electrodes to produce pitch-impregnated

electrodes, and (8) unloading said pitch-impregnated electrodes from said second palette means; said first and second



palette transporting courses each defining a closed path separate and independent of each other.

4,103,047

FABRIC TREATMENT COMPOSITIONS

Wahib Nassif Zaki, Brussels, Belgium, and Alan Pearce Murphy, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 543,606, Jan. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,311, Apr. 16, 1974, abandoned. This application Sep. 3, 1976, Ser. No. 720,176

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

Int. Cl.[2] B05D *3/12;* **B32B** *3/10*

U.S. Cl. 427—242 **26 Claims**

1. A method for imparting a softening and anti-static effect to fabrics in an automatic laundry dryer comprising commingling pieces of damp fabrics by tumbling said fabrics under heat in an automatic clothes dryer with an effective amount of a fabric softening composition, said composition having a melting point greater than about 38° C and being flowable at dryer operating temperature, said composition comprising from about 50% to about 90% of a fatty alkyl sorbitan ester component and from about 10% to about 50% of a cationic antistatic/fabric softener component.

4,103,048

LOW TEMPERATURE VAPOR SEALING OF ANODIZED ALUMINUM

Andrew Alexander, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 642,894, Dec. 22, 1975, Pat. No. 4,031,275. This application Dec. 27, 1976, Ser. No. 754,130

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] C25D *11/24*

U.S. Cl. 427—248 R **8 Claims**

1. A method of forming a low temperature seal on anodized aluminum which comprises exposing said anodized aluminum to ammonia vapors to provide a seal thereon such that immersing said sealed anodized aluminum for a period of 15 minutes in a solution containing 2.0 wt.% chromic and 3.5 wt.% phosphoric acid at a temperature of 100° F produces a weight loss of not more than 3 mg./in.[2].

4,103,049

PROCESS FOR APPLYING RESINOUS COATING TO METAL SURFACE

Takao Nishida, and Kiyoshi Tonoike, both of Osaka, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 446,032, Feb. 26, 1974, abandoned. This application Sep. 2, 1976, Ser. No. 720,033

Claims priority, application Japan, Mar. 2, 1973, 48-25469

Int. Cl.[2] B05D *1/18, 3/02*

U.S. Cl. 427—341 **32 Claims**

1. A process for applying a resinous coating to a metal surface comprising immersing the surface in an acidic aqueous coating composition comprising about 5 to about 550 g/l of solid resin particles, and of pH within the range of about 1.6 to about 5 and prepared from hydrofluoric acid, and about 0.025 to about 50 g/l of a metal-containing compound which is soluble in said composition, the metal of said compound selected from the group consisting of silver, iron in its divalent state, copper in its divalent state, cobalt in its divalent state, chromium in its trivalent state, cadmium, tin in its divalent state and lead in its tetravalent state, said composition being effective in forming on said metal surface a resinous coating which increases in weight or thickness the longer said surface is immersed in said composition, and withdrawing the resinous coated surface from said composition.

4,103,050

AQUEOUS COIL COATING PRIMER

Charles L. Laskin, Cleveland, and Timothy I. Memmer, Strongsville, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,063

Int. Cl.[2] B05D *1/38, 3/02;* **B32B** *15/08;* **C08L** *75/06*

U.S. Cl. 427—379 **14 Claims**

1. A heat-curable coil coating primer in aqueous dispersion for priming metal coil stock comprising:

a. a film-forming binder phase of a heat-curable, water-dispersed polyurethane polymer and a water-dispersed, heat-curable resinous latex in synergistic combination; and

b. a pigment phase of corrosion-inhibiting pigment, said synergistic combination of said polyurethane polymer and said resinous latex improving one or more of the following properties of said primer when said primer is applied to metal coil stock, topcoated, and heat cured: flexibility and impact resistance, adhesion to said coil stock and to a topcoat applied over said primer, humidity and water resistance, and chemical and corrosion resistance.

4,103,051

PILLING REDUCTION IN TEXTILES

Larry B. Farmer, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 3, 1975, Ser. No. 628,268

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—394 **8 Claims**

1. A method for reducing the pilling tendency of textiles containing polyester fibers which consists essentially of treating the textile with an effective amount of an aliphatic diamine having at least 10 carbon atoms to provide a concentration of the diamine on the textile of from about 0.5 to about 10 weight percent, based on the dry weight of the textile.

4,103,052

TWO-WAY WINDOW GRID

John J. Summers, and Larry G. Willis, both of Vincennes, Ind., assignors to National Gypsum Company, Dallas, Tex.

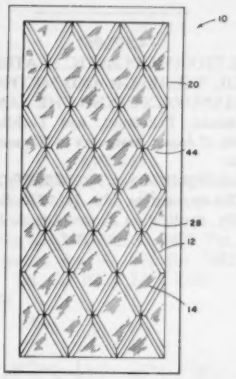
Continuation of Ser. No. 672,149, Mar. 31, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,742

Int. Cl.[2] B32B *3/00, 17/06*

U.S. Cl. 428—38 **7 Claims**

1. A single sheet of glass having the appearance of a plurality of parallelogram panes of clear glass with real cross-bars there-

between, said sheet of glass consisting essentially of a flat backing sheet of clear glass and a pigmenting opaque coating on portions of only one face of said backing sheet, said coating being disposed in a pattern consisting of cross-bar designs defining the edges of said parallelogram panes, each said cross-bar design consisting of a pair of spaced, parallel truncated triangles, each said truncated triangle having two parallel long sides of uneven length and two short sides each forming an acute angle with the longer of the two long sides, said two short sides having respective directions of 90° relative to the opposite short side, said cross-bars having junctions whereat four cross-bars substantially meet, said cross-bars having short sides of said truncated triangles spaced from short sides of truncated triangles of adjacent cross-bars, said spacing between cross-bars being substantially equal to the spacing between the truncated triangles of each said cross-bar, and said spacings all being free of any coating and each being substantially less than the width of said truncated triangles.



7. The method of making a glass sheet having the appearance of a plurality of panes of clear glass with real cross-bars therebetween, comprising the steps of applying an opaque coating to preselected areas of an otherwise clear glass backing, applying said coating on only one face of said glass backing, using only one coating composition for said application of said coating, forming said preselected areas for coating to represent a three-dimensional element of non-uniform height from the plane of the said one face, providing said three-dimensional appearance by forming the appearance of a highlight line, forming said highlight line appearance by omitting coating along a narrow line with coating disposed on the two sides of said narrow uncoated line wherein said three dimensional element is a grid of cross-bars and wherein a highlight line as defined therein is formed along the center of said cross-bars and at the ends of said cross-bars where said cross-bars abut the ends of adjacent cross-bars.

4,103,053

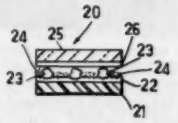
PRESSURE SENSITIVE LAMINATE AND METHOD OF FORMING SAME

Myron Barehas, 280 First Ave., New York, N.Y. 10009

Filed Apr. 9, 1976, Ser. No. 675,648
Int. Cl.[2] B32B *3/24, 3/30, 5/18*
U.S. Cl. 428—40 **14 Claims**

1. A labelling laminate comprising:
a carrier layer
a pigmenting layer adhesively connected to one side of said carrier layer,
a transparent, adhesively backed, covering layer which is aggressively adhesive on one side thereof, over substantially the entire area thereof,
and spacing means disposed on said one side of said carrier layer and between said one side and said adhesive side of said covering layer for normally maintaining said one side of said carrier layer and said adhesive side of said covering layer in slightly spaced apart relationship so that the application of a predetermined pressure on said layers causes said adhesive side of said covering layer to be disposed into intimate contact with said pigmenting means permitting said pigmenting means to adhere to said adhesive side of said covering layer in the area of intimate contact therebetween and rendered releaseable therewith when said covering layer is stripped from said carrier layer whereby said covering layer can thereafter be adhesively secured as a label to an article.

13. A method of making a pressure sensitive transfer laminate comprising the steps of:
bonding spacer elements to a substrate laminate,
releaseably bonding a pigment coating to said substrate between said spacer elements whereby the thickness of said pigmented coating is less than the thickness of said spacer elements,
disposing a transparent covering layer having one surface thereof entirely coated with a layer of adhesive onto said spacer elements so that said adhesive contacts said spacer elements whereby the adhesive surface of said covering layer is normally spaced from said pigment coating.



applying a predetermined amount of pressure onto said layers whereby the adhesive backed layer is pressed into intimate contact with said pigment coating in the area of said applied pressure,
and separating said transparent covering layer whereby the portion of the pigmented coating in contact with the adhesive back of said covering layer is removed therewith,
and adhereing said separated layer to a supporting surface whereby the adhered pigmented coating is rendered readily visible through said transparent covering layer.

14. A method of making a pressure sensitive transfer laminate comprising the step of forming a substrate laminate with a series of embossments,
releaseably bonding a coloring pigment to said substrate in the voids defined by said embossments whereby the embossments extend beyond the surface of said coloring pigment,
disposing a laminate having one side entirely coated with an adhesive layer onto said embossments so that said adhesive contacts said embossments whereby the adhesive layer of said laminate is normally spaced from said coloring pigment.

4,103,054

SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR PREPARATION THEREOF

Miyoshi Okamoto, Takatsuki, and Syusuke Yoshida, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 805,873
Claims priority, application Japan, Jun. 17, 1976, 51-70379
Int. Cl.[2] B32B *33/00;* **D06C** *11/00*
U.S. Cl. 428—91 **30 Claims**

1. A suede-like raised woven fabric of combination weave construction having raised fibers covering the surface thereof, comprising a warp yarn of 30 to 300 denier consisting mainly of fibers each having a thickness of 1.0 to 8.0 denier; a first weft spun yarn of 50 to 1,000 denier consisting of plural staple fibers, each staple consisting of a bundle of extra fine component fibers of 0.0001 to 0.4 denier; a second weft yarn of 30 to 300 denier consisting mainly of fibers having a thickness in a range

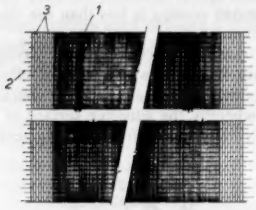
between 1.0 and 8.0 denier, at least one of said warp and said second weft being substantially free from crimps, each thread of said first weft floating over the adjoining three to seven threads of said warp, said raised fiber consisting of said extra fine component fibers of said first weft.

4,103,055

POROUS STRUCTURE

Fernand Jacques Levy, Paris, France, assignor to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France

Filed May 24, 1976, Ser. No. 689,042
Claims priority, application France, May 26, 1975, 75 16307
Int. Cl.[2] B32B *5/12, 7/14;* **D04H** *1/58*
U.S. Cl. 428—113 **4 Claims**



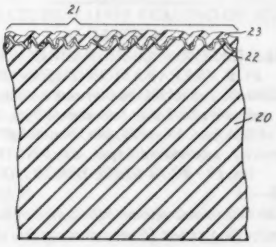
1. A high-strength panel structure of accurately predetermined porosity comprising an assembly of at least about 5 superposed fabric layers each composed of basic boron mono-filaments maintained in parallel closely-adjacent relationship by non-boron transverse yarns interwoven therewith, the number of boron mono-filaments in each said layer ranging from about 18 to about 40 per centimeter and the spacing between said transverse yarns being substantially larger than the spacing between said boron filaments, the lenghwise direction of the boron filaments of each layer extending at an angle with the lengthwise direction of the parallel boron filaments of the next successive layer so that the boron filaments of adjacent layers intersect each other at a multiplicity of pinpoint crossing points, and a bonding material external to said boron filaments for holding said layers in said assembly, said bonding material being essentially confined to said pinpoint crossing points.

4,103,056

RESILIENT WOOD REPLICATION

Eugene L. Baratto, White Bear Township, Ramsey County, Minn., and Eugene J. Dupre, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 14, 1976, Ser. No. 705,161
Int. Cl.[2] D06N *7/04*
U.S. Cl. 428—142 **7 Claims**



1. A resilient wood replication especially suited for use as floor covering comprising in combination:

(1) a resilient polyurethane elastomeric base at least 30 mils thick and having a molded textured wood-grain surface, said polyurethane elastomer being formed of a precursor material which has an initial liquid state permitting it to be poured into a mold having the negative of a wood grain pattern and being capable of nearly perfectly reproducing a counterpart of the mold's surface upon curing, forming an elastomeric product which is flexible, durable and tough, resilient, water-resistant and resistant to permanent deformation at temperatures in the range of about −30° to +70° C and having an elongation at break of at least 50%, a tensile strength of at least about 100 psi, a hardness value within the range of about 20 to 90 Shore A durometer, a compressive strength in the range of about 150 to 4000 psi at 50% deflection and a tear strength which exceeds 20 lbs. per inch thickness;

(2) sufficient wood stain applied over said molded textured wood-grain surface to make it resemble stained wood; and

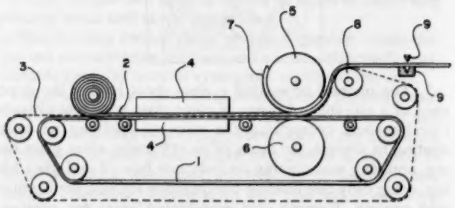
(3) a layer at least 1 mil thick of a clear, tough, abrasion-resistant, flexible, adherent polyurethane material overcoating the stained molded textured wood-grain surface.

4,103,057

DUPLICATE THERMOPLASTIC PLATES, MATRICES USEFUL THEREFOR AND METHODS OF MANUFACTURING THE SAME

Yasuyuki Takimoto, Takatsuki, and Toshikazu Yoshikawa, Hirakata, both of Japan, assignors to Nippon Paint Company, Osaka, Japan

Continuation-in-part of Ser. No. 458,855, Apr. 8, 1974, abandoned. This application Jun. 24, 1976, Ser. No. 699,213
Claims priority, application Japan, Apr. 8, 1973, 48-39941
Int. Cl.[2] B41D *7/02*
U.S. Cl. 428—156 **11 Claims**



1. A duplicate thermoplastic printing plate bearing a printing relief pattern theron, said printing plate comprising a sheet having a thickness of 1.0 to 10 mm, said sheet comprising syndiotactic 1,2-polybutadiene having a crystallinity of approximately 10 to 30% and an intrinsic viscosity of greater than approximately 0.7 when measured in toluene at 30° C.

4,103,058

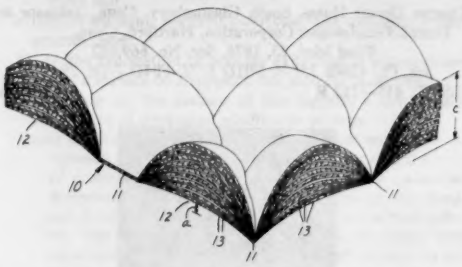
PILLOWED WEB OF BLOWN MICROFIBERS

Larry D. Humlicek, Rice Lake, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 507,879, Sep. 20, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,089
Int. Cl.[2] B32B *3/00, 27/02*
U.S. Cl. 428—171 **15 Claims**

1. A low-density web comprising a coherent mass of blown microfibers arranged into compacted high-density regions and pillowed low-density regions, the pillowed regions spanning the space between adjacent compacted regions, with the microfibers arching outwardly from their level in a compacted region into a pillowed region, whereby in a free-standing condition of the mass the pillowed regions are displaced to one side of a plane defined by the base of the compacted regions are anchored at their edges by the compacted regions and have an

expanded and arched configuration in which the span length from compacted region to compacted region of the most



highly arched microfibers is greater than that of less highly arched microfibers.

4,103,059

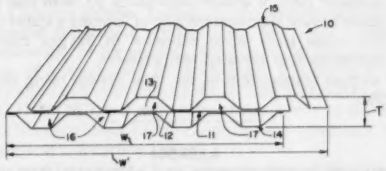
LIGHT TRANSMITTING BUILDING PANEL

Glenn E. Kautz, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Division of Ser. No. 624,275, Oct. 20, 1975, Pat. No. 4,020,989. This application Sep. 14, 1976, Ser. No. 723,148

Int. Cl.[2] B32B *3/12, 3/28*

U.S. Cl. 428—178 **7 Claims**



1. In a light transmitting building panel, the combination consisting essentially of:

a flat central sheet having a first face and opposite thereto a second face;

lower and upper corrugated sheets confronting, respectively, said first face and said second face, and each being secured to said flat central sheet along contiguous portions thereof by means of a light transmitting adhesive, said corrugated sheets cooperating with said flat central sheet to provide plural upper cells and plural lower cells;

said upper corrugated sheet being laterally offset relative to said lower corrugated sheet such that each upper cell is presented intermediate of adjacent ones of said lower cells; and

said flat central sheet and said lower and upper corrugated sheets being formed from a light transmitting glass fiber reinforced plastic;

said flat central sheet presenting opposite first and second longitudinal edges;

said lower corrugated sheet being presented intermediate of said first and second longitudinal edges; and

said upper corrugated sheet having one longitudinal side inwardly offset from said first longitudinal edge to expose a face strip of said flat central sheet and an opposite longitudinal side presented beyond and spaced-apart from the second longitudinal edge of said flat central sheet.

4,103,060

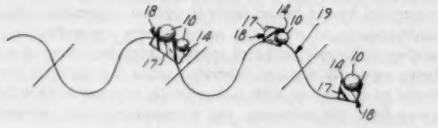
AREA-RETROREFLECTORIZATION OF FABRICS

Wallace Karl Bingham, North Saint Paul, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 540,286, Jan. 10, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,332

Int. Cl.[2] B32B *5/16, 17/06*

U.S. Cl. 428—241 **35 Claims**



1. Fabric treated on at least one surface with a discontinuous sparse retroreflective treatment that has low visibility in daylight but provides a bright retroreflection at night, said treatment comprising discrete separated retroreflective areas that each include a thin layer of binder material adhered to the fabric and separated from the binder material of other retroreflective areas, and one or more glass microspheres that average no more than about 200 micrometers in diameter supported as a monolayer in said layer of binder material; at least about one-third of the microspheres adhered to the fabric in said retroreflective areas having specular reflective means in optical connection between them and the fabric and having their outwardly facing surface optically exposed for receiving and returning light rays, whereby they retroreflect incident light that is normal to the fabric; there being no more than about 2000 microspheres in any square centimeter of said treatment; and the maximum surface dimension of said retroreflective areas being no greater than about 1 millimeter.

8. Fabric treated on at least one surface with a discontinuous sparse retroreflective treatment that provides in aggregate at least about one candella per square meter of the fabric per lux of light incident on the fabric but leaves the fabric with nearly its full original hand, breathability, and appearance whereby the fabric may be made into comfortable garments having an inconspicuous daytime appearance, said treatment comprising discrete separated retroreflective areas that each include a thin layer of binder material adhered to the surface of the fabric and separated from the binder material of other retroreflective areas, and one or more transparent microspheres that average less than about 100 micrometers in diameter supported as a monolayer in said layer of binder material; at least about one-third of the microspheres adhered to the fabric in said retroreflective areas having specular reflective means in optical connection between them and the fabric and having their outwardly facing surface optically exposed for receiving and returning light rays, whereby they retroreflect incident light that is normal to the fabric; the maximum surface dimension of said retroreflective areas being no more than about one millimeter and there being no more than about 500 microspheres per square centimeter of said treatment.

15. A method for providing a retroreflective treatment on a fabric comprising

A. depositing onto the fabric a free-flowing mass of retroreflectorization particles that comprise (1) on the average no more than about fifty transparent microspheres arranged in a closely packed monolayer; (2) a solid binder layer in which the microspheres are supported and which may at least in part be softened to adhere the particles to the fabric; and (3) specular reflective means underlying the monolayer of microspheres and supported by the binder layer in optical connection with the microspheres whereby the microspheres are made retroreflective; the surface of the microspheres opposite from the reflective means being optically exposed to receive and return light rays; and

B. providing conditions to soften said binder layer, whereby

at least a portion of said retroreflectorization particles become adhered to the fabric with the optically exposed surfaces of the microspheres facing away from the fabric.

18. A free-flowing mass of minute discrete retroreflectorization particles useful for forming a retroreflective coating on a substrate, said particles individually comprising on the average one up to about 50 transparent microspheres supported as a closely packed monolayer by a solid binder layer which may at least in part be softened to adhere the particles to a substrate; and specular reflective means underlying the microspheres and supported by the binder layer in optical connection with the microspheres to make the microspheres retroreflecting; the surface of the microspheres opposite from the reflective means being optically exposed whereby, when the particles are adhered to a substrate with said optically exposed surface facing away from the substrate, the microspheres will retroreflect light incident on the substrate.

4,103,061

PROTECTIVE MEMBRANE FLASHING

Harry Chomes, 29 Jameson Rd., Newton, Mass. 02158

Continuation of Ser. No. 440,650, Feb. 8, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,588

Int. Cl.[2] B32B *7/12*

U.S. Cl. 428—247 **4 Claims**

1. A protective membrane flashing for a building structure, formed by shaping a water-resistant sheet characterized as having substantial resistance to flexure, cutting and low temperature and being further characterized as being sufficiently flexible and free-forming so as to drape into desired form; said sheet comprising a thin polyester film held between fibrous glass mesh sheets with a resinous adhesive layer, said resinous adhesive layer adhering substantially to the back portions but not penetrating substantially into the mesh openings, whereby the mesh opening volumes are substantially unfilled and the outer surface of the mesh is uncoated by the adhesive.

4,103,062

ABSORBENT PANEL HAVING DENSIFIED PORTION WITH HYDROCOLLOID MATERIAL FIXED THEREIN

Gerhard M. Aberson, Downers Grove, and Emily M. Stulgate, Oak Park, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jun. 14, 1976, Ser. No. 695,683

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—283 **8 Claims**

1. An absorbent fibrous structure suitable for use as an absorbent component in absorbent products comprising: a cellulosic fibrous batt having a first portion which is a highly porous, loosely compacted, region of relatively low cohesive strength, relatively low capillarity, relatively poor shape and volume stability and relatively low fluid retentivity, and a second portion which is a densified, compacted, porous, absorbent fibrous region having relatively high cohesive strength, relatively good capillarity, relatively good shape and volume stability and relatively high fluid retentivity, said second portion being integrally connected to said first portion of said batt, and a particulate hydrocolloid material distributed in at least one of said portions of said fibrous batt and fixed therein by bonding to cellulosic fibers in said batt.

4,103,063

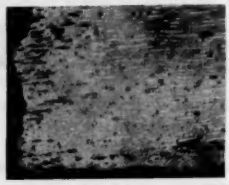
CERAMIC-METALLIC EUTECTIC STRUCTURAL MATERIAL

Charles Orcutt Hulse, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,432

Int. Cl.[2] C04B *35/76;* **F01D** *5/78;* **F04D** *7/06, 29/02*

U.S. Cl. 415—212 R **6 Claims**



1. A directionally solidified gas turbine airfoil having

a. an oxide ceramic matrix having an oxygen diffusivity of less than about 10^{-10} cm^2/sec at 1400° C,

b. a fibrous reinforcing second phase having a diameter of from about 1 to about 10 microns and a length to diameter ratio of greater than about 10, with said fibrous phase having the characteristic of forming a stable protective oxide layer upon exposure to oxygen containing atmospheres at elevated temperatures, with the overall composition of the total system being that of eutectic.

2. An oxidation resistant structural ceramic composite material suited for use at elevated temperatures which comprises

a. an oxide ceramic matrix having an oxygen diffusivity of less than about 10^{-10} cm^2/sec at 1400° C,

b. a metallic fibrous reinforcing second phase having a diameter of from about 1 to about 10 microns and a length to diameter ratio of greater than about 10, with said fibrous phase having the characteristic of forming a stable protective oxide layer upon exposure to oxygen containing atmospheres at elevated temperatures,

with overall composition of the total system being that of a eutectic.

4,103,064

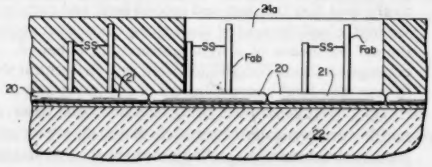
MICRODEVICE SUBSTRATE AND METHOD FOR MAKING MICROPATTERN DEVICES

James H. McAlear, Gaithersburg, and John M. Wehrung, Potomac, both of Md., assignors to Dios, Inc., Potomac, Md.

Filed Jan. 9, 1976, Ser. No. 647,871

Int. Cl.[2] B05D *5/00;* **B32B** *9/02*

U.S. Cl. 428—333 **52 Claims**



1. A microsubstrate for the production of micropatterns, comprising

a substrate base;

a protein layer overlying said substrate base and comprising a compresseed monolayer of denatured non-fibrous protein adhered to said base,

said denatured protein having a maximum molecular dimension not greater than 500 Angstrom units and a ratio of greatest molecular dimension to smallest molecular dimension of at least 2:1;

the molecules of said denatured protein having a hydrophilic side and a hydrophobic side facing in generally

opposite directions and separated by a dimension which is small relative to the maximum dimension of the molecule; and

a film of masking material overlying and adhered to said protein layer.

31. In the fabrication of articles exhibiting a micropattern carried by a surface of a support, the method comprising

establishing on the surface of the support a compressed monolayer of denatured nonfibrous protein,

said denatured protein having a maximum molecular dimension not greater than 500 Angstrom units and a ratio of greatest molecular dimension to smallest molecular dimension of at least 2:1, the molecules of said denatured protein having a hydrophilic side and a hydrophobic side facing in generally opposite directions and separated by a dimension which is small relative to the maximum dimension of the molecule;

establishing a film of masking material which overlies said compressed monolayer and is characterized by being so modified by radiant energy as to be removable;

directing radiant energy on said film in an area predetermined by the micropattern desired; and

removing said film from only said predetermined area to expose said monolayer for further treatment.

4,103,065
COATED POLYCARBONATES AND ACRYLICS

Donald W. Gagnon, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 12, 1976, Ser. No. 713,730
Int. Cl.[2] B32B *27/42*; C08L *43/04, 83/04*; B32B *27/16*
U.S. Cl. 428—336 **13 Claims**

1. In a coated polycarbonate or acrylic article having an externally disposed surface layer of a heat cured reaction product obtained by

I. combining

(a) a solvent-soluble, further-curable organopolysiloxane partial condensate product resin, said resin consisting essentially of the product obtained by the acid hydrolysis of a compound of the formula $CH_3Si(OR')_3$ or a mixture of compounds of the formula $CH_3Si(OR')_3$ and $C_6H_5Si(OR')_3$ in a mole ratio of the former to the latter of between about 1:10 to about 10:1 and wherein R′ is an alkyl of 1–6 carbon atoms,

(b) about 3 to about 15 parts by weight per 100 parts by weight of (a) an alkylated melamine formaldehyde partial condensate resin in an organic solvent solution,

II. applying said organic solvent solution onto a polycarbonate, or acrylic article, and

III. evaporating said organic solvent and heat curing the residue to form said reaction product, the improvement wherein said surface layer consists essentially of the heat cured reaction product obtained by combining said (a) and (b) constituents and about 25 to about 400 parts by weight per 100 parts by weight of (a) of

(c) a composition containing (1) from about 5 to about 62 percent by weight of a linear diol, (2) from about 8 to about 35 percent by weight of a thermosetting acrylic containing about 10 percent by weight of the acrylic of an unsaturated carboxylic acid, from about 4 to about 10 percent by weight of the acrylic of a hydroxyalkyl ester of an alpha, beta-unsaturated carboxylic acid, with the remainder comprising at least one alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and (3) from about 17 to about 87 percent by weight of a crosslinking agent, and

(d) an effective ultraviolet stabilizing amount of an ultraviolet stabilizer, said surface layer having a thickness of about 0.3 mils to about 1.8 mils.

8. An organic solvent solution consisting essentially of

(a) a solvent soluble, further-curable organopolysiloxane partial condensate product resin, said resin consisting essentially of the product obtained by the acid hydrolysis of a compound of the formula $CH_3Si(OR')_3$ or a mixture of compounds of the formula $CH_3Si(OR')_3$ and $C_6H_5Si(OR')_3$ in a mole ratio of the former to the latter of between about 1:10 to about 10:1 and wherein R′ is an alkyl of 1–6 carbon atoms, and

(b) about 3 to about 15 parts by weight per 100 parts by weight of (a) an alkylated melamine formaldehyde partial condensate resin in an organic solvent solution, and

(c) about 25 to about 400 parts by weight per 100 parts by weight of (a) of a composition containing (1) from about 5 to about 62 percent by weight of a linear diol, (2) from about 8 to about 35 percent by weight of a thermosetting acrylic containing about 10 percent by weight of the acrylic of an unsaturated carboxylic acid, from about 4 to about 10 percent by weight of the acrylic of a hydroxyalkyl ester of an alpha, beta-unsaturated carboxylic acid, with the remainder comprising at least one alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and (3) from about 17 to about 87 percent by weight of a crosslinking agent, and

(d) an effective ultraviolet stabilizing amount of an ultraviolet stabilizer.

4,103,066
POLYCARBONATE RIBBON FOR NON-IMPACT PRINTING

Gary Fred Brooks, San Jose; Walter Crooks, and William Joseph Weiche, both of Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

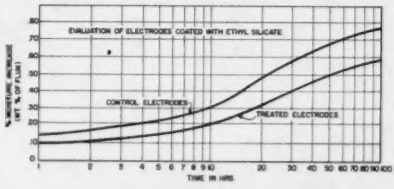
Filed Oct. 17, 1977, Ser. No. 842,652
Int. Cl.[2] B32B *9/04*
U.S. Cl. 428—337 **6 Claims**

6. A ribbon for non-impact printing comprising a transfer layer and a substrate of about 15 microns thickness which is a polycarbonate resin containing about 30% by weight of electrically conductive carbon black.

4,103,067
LOW HYDROGEN WELDING ELECTRODES

Clarence E. Jackson, 866 Mission Hills La., Worthington, Ohio 43085, and Albert A. Freeman, 17015 Hillview La., Spring, Tex. 77373

Continuation-in-part of Ser. No. 646,930, Jan. 6, 1976, abandoned, which is a continuation of Ser. No. 535,822, Dec. 23, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,602
Int. Cl.[2] B23K *35/365*
U.S. Cl. 428—387 **17 Claims**



1. In an arc welding electrode for producing ferrous weld metal having low amounts of hydrogen therein so that hydrogen-assisted cracking is minimized, said electrode having a ferrous filler wire core and flux covering thereon of predetermined constituents, said flux covering having a moisture level of less than about 0.6 percent, the improvement comprising:

a binder of hydrolyzed organic silicate for binding said constituents together, said binder being characterized by the fact that it makes substantially no contribution to said moisture level and makes said flux covering resistant to hygroscopic moisture pickup before said electrode is used for welding, said binder thereby minimizing the amount of hydrogen from said flux covering which may be poten-

tially introduced into said ferrous weld metal during welding, and

one of said constituents being a source of barium, said barium being present in an amount from about 0.1% to about 5% by weight and being effective to reduce the slag/metal reaction temperature during welding, whereby the amount of hydrogen introduced into said ferrous weld metal from said flux covering and binder is minimized.

6. In an arc welding electrode for producing ferrous weld metal having low amounts of hydrogen therein so that hydrogen-assisted cracking is minimized, said electrode having a ferrous filler wire core and flux covering thereon of predetermined constituents, said flux covering having a moisture level of less than about 0.6 percent, the improvement comprising:

a binder of hydrolyzed organic silicate for binding said constituents together, said binder being characterized by the fact that it makes substantially no contribution to said moisture level and makes said flux covering resistant to hygroscopic moisture pickup before said electrode is used for welding, said binder thereby minimizing the amount of hydrogen from said flux covering which may be potentially introduced into said ferrous weld metal during welding, and

one of said constituents being a source of cesium, said cesium being present in an amount from about 0.1% to about 5% by weight and being effective to reduce the slag/metal reaction temperature during welding, whereby the amount of hydrogen introduced into said ferrous weld metal from said flux covering and binder is minimized.

4,103,068

POLYESTER FILAMENTARY YARNS

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 653,974, Jan. 30, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,913

Int. Cl.[2] B32B *27/00;* **D02G** *3/00*

U.S. Cl. 428—395 **4 Claims**

1. A synthetic filamentary yarn comprised of polyethylene terephthalate filaments which are first treated with from about 0.3 to about 0.6 weight percent based on the weight of the yarn of a liquid composition consisting essentially of about 10 to about 20 weight percent of said composition of refined coconut oil, about 10 to about 20 weight percent of said composition of a stearic acid ester of a branched chain alcohol having 14–15 carbon atoms, about 3.0 to about 6.0 weight percent of said composition of ethoxylated tallow amine, about 10 to about 20 weight percent of said composition of ethoxylated lauryl alcohol, about 8.0 to about 12.0 weight percent of said composition of sodium salt of alkylarylsulfonate, about 1.0 to about 3.0 weight percent of said composition of dinonyl-sodium-sulfosuccinate, and about 35 to 50 weight percent of said composition of white mineral oil having a boiling point of between 510° and 620° F., wherein at least about 0.15 to about 0.30 weight percent is retained on said yarn; and then treated with from about 0.7 to about 1.2 weight percent on said yarn of a liquid composition consisting essentially of about 13 to about 25 weight percent of said composition of a compound selected from the group consisting of glycerol monooleate and decaglycerol tetraoleate with ethoxylated tall oil fatty acids, about 12 to about 20 weight percent of said composition of a compound selected from the group consisting of sulfated glycerol trioleate and ethoxylated tallow amine, and about 55 to about 75 weight percent of said composition of a stearic acid ester of a branched chain alcohol having 14–15 carbon atoms.

4,103,069

COATED SILVER ACTIVATED ZINC SULFIDE CATHODE RAY TUBE

Harry O. Schulze, Wyalusing; Robert E. Dodds, and Raymond F. Herner, both of Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 6, 1976, Ser. No. 729,905

Int. Cl.[2] B32B *9/00;* **C09K** *11/10*

U.S. Cl. 428—403 **10 Claims**

1. Cathode ray phosphor compositions consisting essentially of discrete particles of a cathodoluminescent material having an average particle size of from about 5 to about 20 micrometers and consisting essentially of a core of a conventional silver-activated zinc sulfide and an adherent relatively uniform coating of magnesium pyrophosphate, aluminum pyrophosphate, and silicon dioxide, with said phosphates being in an equal molar relationship, said coating being at a sufficient level to provide a PO_4 content of from about 0.05% to about 0.2% by weight of the total composition and the silicon dioxide content of the total composition is from about 0.02% to about 0.07% by weight of the total composition.

4,103,070

SAFETY GLASS LAMINATES WITH ALIPHATIC/CYCLOALIPHATIC POLYCARBONATE URETHANES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 681,013, Apr. 28, 1976, Pat. No. 4,024,113. This application Feb. 11, 1977, Ser. No. 767,936

Int. Cl.[2] B32B *17/10, 27/36, 27/40*

U.S. Cl. 428—412 **3 Claims**

1. A safety glass laminate comprising:

a. a ply of glass; and

b. bonded to said ply of glass a ply of transparent, energy absorbing polyurethane which is the reaction product of:

(1) an organic diisocyanate:

(2) an organic compound having two isocyanate-reactive hydrogens and a molecular weight less than about 250; and

(3) a polycarbonate diol prepared from a mixture of linear aliphatic and cycloaliphatic diols wherein the aliphatic diol has at least 4 carbon atoms comprising (a) at least 30 mole percent linear aliphatic diol and (b) at least 10 mole percent cycloaliphatic diol.

4,103,071

THERMOPLASTIC RECORDING MEMBERS CONTAINING SILICONE OIL, FLUOROCARBON OIL OR CHLOROFLUOROCARBON OIL HAVING IMPROVED DEFORMATION PROPERTIES OF SURFACE

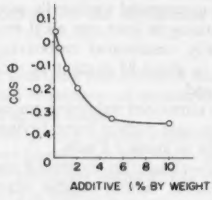
Michiharu Abe, Kawasaki, and Akiyoshi Oride, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1976, Ser. No. 674,372

Claims priority, application Japan, Apr. 11, 1975, 50-43426

Int. Cl.[2] G03G *16/00;* **G03C** *5/04;* **B32B** *27/00*

U.S. Cl. 428—421 **4 Claims**



1. Thermoplastic recording member for use in recording

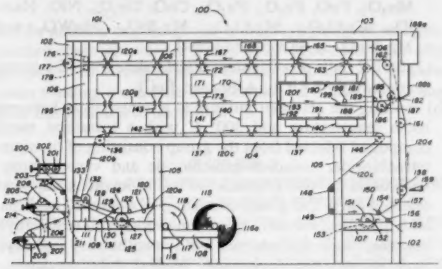
information by deformation of a surface recording layer; said member comprising a support which is electrically conductive or photoconductive and a surface recording layer comprising a thermoplastic resin film containing from 0.1 to 10% by weight, based on the weight of the film, of at least one member selected from the group consisting of silicone oils, fluorocarbon oils and chlorofluorocarbon oils.

4,103,072

METHOD OF PRODUCING DIAZOTYPE PHOTOPRINTING MATERIAL

Irving R. Valentine, Chicago, Ill., assignor to Weber-Valentine Company, Inc., Elk Grove Village, Ill.

Division of Ser. No. 621,129, Oct. 9, 1975, abandoned. This application Jul. 9, 1976, Ser. No. 703,970
Int. Cl.[2] D21H *5/08*
U.S. Cl. 428—425 **5 Claims**



3. A translucent water absorbent natural fiber material comprising a water absorbent natural fiber material having absorbed therein an effective amount of a water emulsion of a water clear synthetic organic resin, said water emulsion containing an emulsifier present in the range of from about 0.5% of about 2% by weight selected from the class consisting of polyoxethylated fatty acids, simple fatty esters, sorbitan esters, ethoxylated fatty acids, ethoxylated fatty amines, ethoxylated sorbitan esters, ethoxylated vegetable oils, ethoxylated alcohols and alkylphends, said water clear resin being present in the range of from about 6% to about 17% by weight selected from the class consisting of polypropylene, polystyrene, polyvinyl chloride, styrene butadiene, carboxylated styrene butaliene, silicone resins and urethanes.

4,103,073

MICROSUBSTRATES AND METHOD FOR MAKING MICROPATTERN DEVICES

James H. McAlear, Gaithersburg, and John M. Wehrung, Potomac, both of Md., assignors to Dios, Inc., Potomac, Md.

Filed Jan. 9, 1976, Ser. No. 647,872
Int. Cl.[2] B05D *5/12*; B32B *9/02*
U.S. Cl. 428—474 **17 Claims**

1. A microsubstrate comprising
a support presenting a supporting surface; and
a thin film overlying said supporting surface and adhered thereto;
said film comprising at least one active enzyme selected from the group consisting of transferases and oxidoreductases,
said enzyme being present in the form of macromolecules uniformly distributed throughout the film.

2. The method for forming a micropattern, comprising
establishing a solid film containing at least one enzyme selected from the group consisting of the transferases and the oxidoreductases,
said at least one enzyme being present in the form of macromolecules retaining their enzymatic activity and which are uniformly distributed throughout said film;
treating said film to restrict said at least one enzyme in its active state to the predetermined areas of said film which are defined by the desired micropattern; and
treating said predetermined areas of said film to carry out throughout said predetermined areas at least one chemical reaction which depends upon presence of said at least one enzyme in active state and which produces a particular reaction product operatively suitable for the purpose of the desired micropattern.

4,103,074

PROCESS FOR COAGULATING POLYMER LATICES USING SCREW-TYPE EXTRUDER

Douglas Leo Hertel, Strongsville, and Robert Wen Lee, North Ridgeville, both of Ohio, assignors to International Basic Economy Corporation, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,077
Int. Cl.[2] C08C *1/14*
U.S. Cl. 528—487 **16 Claims**

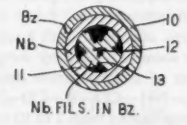
1. The process of coagulating a polymer latex comprising mixing and mechanically working the polymer latex and a coagulant under pressure in an extruder to produce a coagulated polymer having moisture content less than 25% by weight, the extruder including an elongated chamber, an axial rotating interrupted worm flight disposed in the chamber for initially contacting and mixing the polymer latex and coagulant in the worm flight to form a coagulating mixture and for advancing the coagulating mixture through the chamber to an extruder exit, and a plurality of stationary breakers projecting into the interior of the chamber intermediate at least some of the segments of the interrupted worm flight, the interrupted worm flight and the breakers cooperating to maintain the coagulating mixture under pressure in the worm flight at least until coagulation of the polymer latex is substantially complete, the segments of the interrupted worm flight and the breakers also cooperating to turbulently mix and mechanically work the constituents of the pressurized coagulating mixture in the worm flight and to break up any coagulated polymer encapsulating uncoagulated polymer latex and release the encapsulated polymer latex for mixture with coagulant, and extruding the coagulated polymer from the extruder exit with a moisture content less than 25% by weight.

4,103,075

COMPOSITE MONOLITHIC LOW-LOSS SUPERCONDUCTOR FOR POWER TRANSMISSION LINE

Erik Adam, Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Oct. 28, 1976, Ser. No. 736,611
Int. Cl.[2] H01B *5/00, 7/34*
U.S. Cl. 428—614 **14 Claims**



1. A composite superconductive tape having:
(a) a rectangular central matrix element having a pair of wider faces and a pair of narrower faces when viewed in cross-section of a nonsuperconductive material in which are embedded a plurality of superconductive filaments;
(b) a pair of layers of superconductive material bonded to said wider pair of faces of said matrix;
(c) a pair of layers of a superconductive precursor material, selected such that it forms a superconductive compound when interreacted with the material of the matrix, bonded to said pair of layers of superconductive material;
(d) a second pair of layers of superconductive material

bonded to said pair of layers of superconductor precursor material; and

(e) a pair of layers of a second nonsuperconductive material bonded to said second pair of layers of superconductive material.

11. A composite superconductive tape having:

(a) a rectangular matrix having a pair of wider faces and a pair of narrower faces when viewed in cross-section comprising a plurality of superconductive filaments embedded in a matrix of normally conductive material; and

(b) at least one layer of superconductive material bonded to each of the wider pair of faces of said rectangular matrix.

4,103,076

CLAD METAL PRODUCT OF Cu, Al AND STAINLESS STEEL

John B. Ulam, McMurray, Pa., assignor to Clad Metals, Inc., Canonsburg, Pa.

Continuation-in-part of Ser. No. 572,732, Apr. 29, 1975, Pat. No. 4,004,892, which is a division of Ser. No. 423,253, Dec. 10, 1973, Pat. No. 3,952,938. This application Nov. 22, 1976, Ser. No. 744,043

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.[2] B32B *15/20*

U.S. Cl. 428—653 **3 Claims**

1. A clad metal product consisting essentially of a core having a member from the group consisting of copper and copper alloys and at least one layer of a member from the group consisting of aluminum and aluminum alloys, said core forming a major thickness portion of said composite and at least one outer cladding layer of stainless steel bonded to said aluminum opposite the copper and copper alloy group member, said product having been made by the steps of mechanically cleaning the contact surfaces of at least the copper and aluminum alloys, joining said sheets under pressure sufficient to reduce the total thickness of said sheets an amount between about 20% to 70% and stress relieving the joined sheets at a temperature in the range about 600° F. to 800° F. to cause diffusion between the sheets.

4,103,077

GREEN STRENGTH OF SYNTHETIC ELASTOMERS

Joseph F. O'Mahoney, Jr., Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 13, 1976, Ser. No. 685,832

Int. Cl.[2] C08F *8/30, 8/32*

U.S. Cl. 526—51 **13 Claims**

1. A process for improving the green strength of synthetic elastomers, comprising:

mixing a synthetic elastomer with a small amount of from about 0.25 to about 2.0 parts by weight per 100 parts of said elastomer of a dihydrazide compound having the formula $NH_2—NH—CO—R—CO—NH—NH_2$ where R is an alkyl group having from 2 to 10 carbon atoms to form a mixture,

said synthetic elastomer made from the solution polymerization of monomers selected from the class consisting of dienes having from 4 to 10 carbon atoms, comonomers of dienes having from 4 to 10 carbon atoms to form copolymers, and comonomers of dienes having from 4 to 10 carbon atoms with olefin monomers having from 2 to about 14 carbon atoms to form copolymers,

producing an improved green strength elastomer by partially cross-linking said elastomer to effect less than a vulcanized elastomer, and

heating said elastomer dihydrazide mixture at a temperature of from about 125° F to about 300° F.

4,103,078

METHOD FOR PRODUCING POLYMERS OF ALPHA-OLEFIN

Akihiro Sato, Yokosuka; Shiro Konotsune, Yokohama; Atsuyuki Kachi, Yokohama, and Hiroshi Shimizu, Yokohama, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 54,865, Jul. 14, 1970, abandoned. This application Mar. 13, 1973, Ser. No. 340,854

Claims priority, application Japan, Aug. 1, 1969, 44-60798

Int. Cl.[2] C08F *4/02*

U.S. Cl. 526—115 **7 Claims**

1. A method for producing polymers of α-olefins which comprises:

(a) mill-mixing together

(1) 1 mol of a metal oxide or non-metal oxide selected from the group consisting of Cu_2O, CuO, Ag_2O, Ag_2O_3, MgO, CaO, SrO, BaO, ZnO, CdO, Ga_2O_3, SnO, SnO_2, PbO, Pb_2O_3, Pb_3O_4, ZrO_2, Bi_2O_3, V_2O_5, WO_3, MnO, Mn_2O_3, FeO, Fe_2O_3, Fe_3O_4, CoO, Co_3O_4, NiO, $NaAlO_2$, $CaAl_2O_4$, $MgAl_2O_4$, Mg_2SiO_4, $MgWO_4$ and Mg_6MnO_8 or SiO_2 or B_2O_3 with

(2) 0.01–2 mols of a trivalent metal halide from the group consisting of $AlCl_3$, $AlBr_3$ and $FeCl_3$,

(b) reacting the resultant mixture at a temperature between room temperature and 300° C with a transition metal compound selected from the group consisting of titaniumtetrachloride, vanadiumtetrachloride and vanadiumoxytrichloride in the presence of an aromatic compound selected from the group consisting of benzene, naphthalene, pyridine, toluene, xylene, mesitylene, durene, ethylbenzene, isopropylbenzene, 2-ethylnapthalene, 1-phenylnaphthalene, dimethylaniline, N-methyl-diphenylamine, triphenylamine, nitrobenzene, p-nitrosotoluene, anisole, phenylether, xylenol, and 2, 6-di-t-butyl-4-methylphenol, and

(c) activating the product of step (b) with an organoaluminum compound selected from the group consisting of trimethylaluminum, triethylaluminum, diethylaluminumchloride, ethylaluminumsesquichloride, and ethylaluminumdichloride so as to thereby form a polymerization catalyst,

(d) introducing into a polymerization zone that contains said polymerization catalyst

(1) a monomer selected from the group consisting of ethylene, propylene, and butene-1, or

(2) said monomer set forth in (d) (1) and a monomer different therefrom consisting of ethylene, propylene, butene-1, hexene1, octene-1, decene-1, 3-methyl-1-butene, 4-methyl-1-pentene, and styrene,

(e) effecting polymerization under polymerization conditions, and

(f) recovering the resulting polymerization product.

4,103,079

HALOGENATED ORGANOALUMINUM COMPOUNDS AND METHOD OF PREPARATION

Warren A. Thaler, Matawan, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

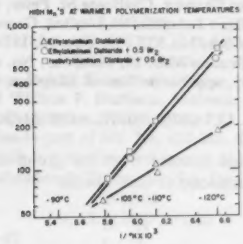
Division of Ser. No. 635,695, Nov. 26, 1975. This application Nov. 1, 1976, Ser. No. 737,917

Int. Cl.[2] C08F *4/52, 36/06, 36/08*

U.S. Cl. 526—185 **4 Claims**

1. An improved process for preparing homopolymers from isoolefins having from 4 to about 20 carbon atoms, said isoolefin being selected from the group consisting essentially of isobutylene, 2-methylbutene, 3-methyl-butene-1, 4-methylpentene-1 or β-pinene, which consisting essentially of contacting the isoolefin at a temperature of or less than about −15° C with a catalyst, the improvement of which consisting essentially of using a ctalyst which comprises a mixture of material of the formula R_mAlX_{3-m} wherein m ranges from 1 to 3 inclusive, R is the same or different alkyl radical of straight or branched chain structure of from 1 to 7 carbon atoms, and X is the same or

different halogen selected from the group consisting of Cl and Br premixed with Y moles of halogen, halogen acid, mixed halogen or organo-halide per mole of aluminum compound wherein the halogen is selected from the group consisting of Cl



and Br and the organo group is an alkyl group of straight or ranched chain structure of from 2 to 20 carbon atoms, an allylic group of 3–20 carbon atoms or a benzylic group of 7–20 carbon atoms yielding a catalytic composition such that (m-Y) ranges from less than 0.7 to about 0.2.

4,103,080

AUXILIARY AGENT FOR IMPROVING RETENTION, DRAINAGE AND TREATMENT ESPECIALLY IN PAPERMAKING, AND USE OF THE AUXILIARY AGENT

Branislav Böhmer, and Lutz Hoppe, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Oct. 4, 1976, Ser. No. 729,852

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545007

Int. Cl.² C08F *2/10, 120/56*

U.S. Cl. 526—303 **6 Claims**

1. A high-molecular weight, water-soluble homopolymer of acrylamide obtained by aqueous solution polymerization of acrylamide monomer in an amount of 3 20% by weight of monomer based on the total solution, at a pH value of 8 to 13 and with the addition of radical initiators in at least three steps at intervals during the polymerization, said initiators being added in a total amount of 0.02 to 1.0% by weight based on the amount of monomer and with the addition of polymerization regulators in an amount of at most 20 g per mol of monomer said regulators being at least one member selected from the group consisting of alkylene glycols, aliphatic dicarboxylic acids, lower aliphatic chlorinated hydrocarbons, acetic acid, metal acetates, citric acid, glycerol, mannitol, taurine and tetrahydrofuran, said homopolymer of acrylamide being in the form of a storage stable homopolymer which has a molecular weight of 30.6 to 98.5 million.

4,103,081

STABILIZED ANAEROBIC ADHESIVES

Stephen Repetto, Vernon, Conn., assignor to Loctite Corporation, Newington, Conn.

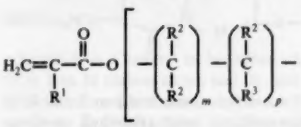
Filed Sep. 3, 1976, Ser. No. 720,458

Int. Cl.² C08F *120/20*

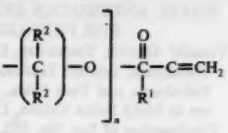
U.S. Cl. 526—323.1 **7 Claims**

1. An anaerobic adhesive system comprising

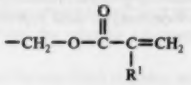
(a) a polyacrylate monomer of the following general formula:



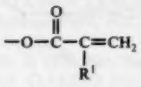
-continued



wherein R^2 represents a radical selected from the group consisting of hydrogen, lower alkyl of from 1 to about 4 carbon atoms, hydroxy alkyl of from 1 to about 4 carbon atoms, and



R^1 is a radical selected from the group consisting of hydrogen, halogen, and lower alkyl of from 1 to about 4 carbon atoms; R^3 is a radical selected from the group consisting of hydrogen, hydroxyl, and



m is an integer equal to at least 1, *n* is an integer equal to at least 1, and *p* is 0 or 1,

(b) a free radical initiator in an amount sufficient to initiate polymerization of the monomer,

(c) an accelerator, and

(d) a nitrobenzene stabilizer having from zero to five substituent groups thereon, said groups being selected from chlorine, bromine and methyl, and from one to two nitro groups.

4,103,082

AMINOCYCLITOL DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Tetsuo Suami, No. 5-8, Naka-machi 3-chome, Musashino-shi, Tokyo, Japan

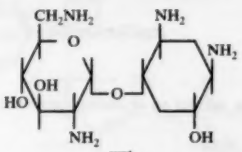
Filed Oct. 7, 1976, Ser. No. 730,396

Claims priority, application Japan, Oct. 7, 1975, 50-120286; Nov. 17, 1975, 50-137222

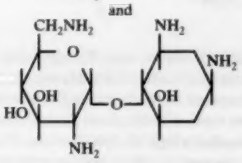
Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **4 Claims**

1. 5-Deoxyneamine and 6-deoxyneamine having the formulae (I*a*) and (I*b*):


(Ia)

and


(Ib)

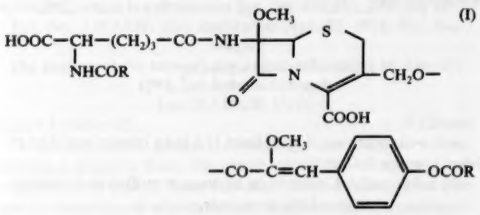
4,103,083

NOVEL ANTIBIOTICS DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Yasuaki Ogawa; Yasumitsu Kondo; Takashi Shomura, all of Yokohama; Takashi Tsuruoka, Kawasaki; Shigeharu Inouye, Yokohama, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

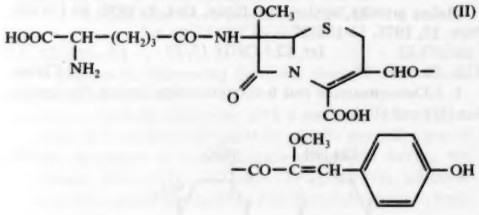
Continuation of Ser. No. 553,710, Feb. 27, 1975, abandoned.
This application Dec. 17, 1976, Ser. No. 751,877
Int. Cl.[2] C07D *501/20*
U.S. Cl. 542—427 3 Claims

1. A process for isolating a 7-(5-acylamido-5-carboxyvaleramido)-3-(α-methoxy-p-acyloxycinnamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid represented by the formula



(I)

wherein R represents alkoxy group having 1 to 4 carbon atoms which may be substituted with halogen atoms; or an arylalkoxy group having 1 to 4 carbon atoms in the alkoxy moiety; the aryl moiety being optionally substituted with halogen atoms, and the salt thereof, from a fermentation broth which comprises cultivating streptomyces viridochromogenes SF-1584 strain which is capable of producing 7-(5-amino-5-carboxyvaleramido)-3-(α-methoxy-p-hydroxycinnamoyloxymethyl)-7-methoxy-3-cephem-4-caboxylic acid of the formula (II)



(II)

in a culture medium, adding an acylating agent of the formula (III)

RCOX (III)

wherein R is as defined above and X represents a halogen atom, in a molar ratio of 2 to 40 moles of said acylating agent per mole of the compound of the formula (II) at a temperature below about 50° C at a pH of from about 7.5 to 8.0 and separating the thus obtained acylate of the formula (I) from said fermentation broth by precipitating and/or extracting with a solvent.

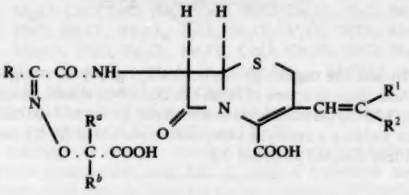
4,103,084

7-(CARBOXY SUBSTITUTED α-ETHERIFIED OXIMINO ARYLACETAMIDO) CEPHALOSPORINS HAVING A 3-VINYL OR SUBSTITUTED VINYL GROUP

Janice Bradshaw, Harrow; Martin Christopher Cook, Liverpool, and Gordon Ian Gregory, Chalfonte St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 533,451, Dec. 16, 1974, abandoned.
This application Mar. 19, 1976, Ser. No. 668,529
Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73
Int. Cl.[2] C07D *501/16;* A61K *31/545*
U.S. Cl. 544—22 8 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

R^a is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R^b is hydrogen, carboxy, C_2-C_5 alkoxycarbonyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

or R^a and R^b together with the carbon atom to which they are attached form a cyclobutylidene, cyclopentylidene or cyclohexylidene group; and

wherein R^1 and R^2 are each hydrogen, carboxy, cyano, C_2-C_7 alkoxycarbonyl, C_{1-6} alkyl, C_{5-7} cycloalkyl, phenyl C_{1-4} alkyl, phenyl, nitrophenyl, tolyl or naphthyl, and physiologically acceptable salt, ester or 1-oxide thereof.

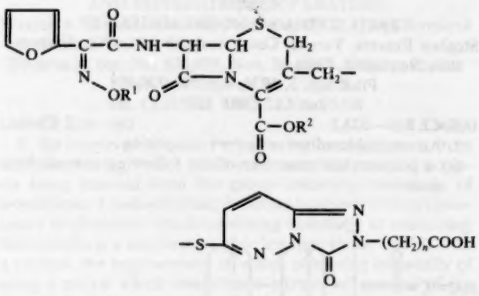
4,103,085

7-(SYN-α-ALKOXY-IMINOFURYLACETAMIDO-3-(2-CARBOXYALKYL-2,3-DIHYDRO-S-TRIAZOLO[4,3-b] PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Seiji Iimura, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,859
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—27 9 Claims

1. A compound having the formula



wherein R^1 is alkyl of 1–4 carbon atoms, n is 1 or 2 and R^2 is hydrogen or pivaloyloxymethyl, acetoxymethyl, methox-

ymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3phthalidyl or 5-indanyl or a nontoxic, pharmaceutically acceptable salt thereof, said compound being a least 75% by weight in the form of its syn isomer.

4,103,086

8-OXO-4-THIA-1-AZABICYCLO (4.2.0)-OCT-2-ENE DERIVATIVES

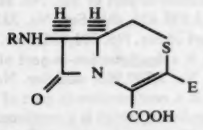
John G. Gleason, Delran; Kenneth G. Holden, Haddonfield, both of N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 626,686, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 574,225, May 5, 1975, abandoned. This application Jun. 8, 1976, Ser. No. 693,992

Int. Cl.[2] C07D *279/08*

U.S. Cl. 544—47 **58 Claims**

1. A compound of the formula



where

R is XCHCO, Y—CH_2CO or Z—S(O)$_n$$CH_2$CO;

A′

X is thienyl; cyclohexyl, cyclohexenyl, cyclohexdienyl, phenyl, or phenyl substituted with one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, hydroxymethyl, halo, nitro, amino, aminomethyl, mercapto, lower alkylthio, trifluoromethyl, ureido, formamido and carboxymethylamino;

A′ is amino, hydroxy, formyloxy, carboxyl or sulfonic acid;

Y is cyano, azido, phenyl, thienyl, furyl, thiazoyl, isothiazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, sydnone, pyridyl, or pyrimidyl, each heterocyclic ring being unsubstituted or substituted with one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, halo, nitro, hydroxy, amino and phenyl;

Z is phenyl, pyridyl, lower alkyl, trifluoromethyl, trifluoroethyl or cyanomethyl;

n is 0, 1, or 2; and

E is hydrogen, methyl, bromomethyl, or lower alkanoyloxymethyl, or a pharmaceutical acceptable salt thereof.

4,103,087

PRODUCTION OF DI-(N,N-DISUBSTITUTED AMINO) ALKANES

Michael E. Brennan, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

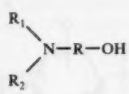
Filed Apr. 1, 1977, Ser. No. 783,594

Int. Cl.[2] C07D *295/12, 295/00, 265/30*

U.S. Cl. 544—78 **13 Claims**

1. A process for producing a di-(N,N-disubstituted amino)alkane compound comprising the steps of:

contacting a tertiary aminoalkanol wherein the hydroxy moiety is either primary or secondary of the formula



wherein R is a normal or branched chain alkylene radical of from 2 to 10 carbon atoms and, R_1 and R_2, independently, are straight or branched chain alkyl radicals of from 1 to 18 carbon atoms, or R_1 and R_2, taken together with the nitrogen atom to which each is attached, form a 4 or 5 membered heterocyclic ring; and a secondary amine of the formula

wherein R_3 and R_4 are defined as R_1 and R_2 above, in the presence of a catalytically effective amout of aluminum phosphate having phosphorus content of from about 20 to about 30 wt. % and a surface area of from about 20 m^2/g to about 50 M^2/g at a temperature of from about 240° C to 320° C under a pressure sufficient to maintain the mixture substantiall in liquid phase; and

recovering from the resultant reaction mixture said di-(N,N-substituted amino)alkane compound.

4,103,088

FORMATION OF CRYSTALLINE [(MONO-TRICHLORO) TETRA-(MONOPOTASSIUM DICHLORO)] PENTA-ISOCYANURATE

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 8, 1976, Ser. No. 721,296

Int. Cl.[2] C07D *251/36*

U.S. Cl. 544—190 **10 Claims**

1. A process for preparing crystalline [(mono-trichloro) tetra-(monopotassium dichloro)] penta-isocyanurate and mixtures containing the same, which comprises:

reacting an unsubstituted or amino substituted triazine selected from the group consisting of purified cyanuric acid, melamine, ammeline, ammelide, ammeline:ammelide complex, cyanuric acid:melamine complex, crude cyanuric acid, and mixtures thereof with at least stoichiometric amounts of potassium hypochlorite in an aqueous medium at a temperature of 35° to 70° C, and at a pH value of 3.2 to 5.7 for less than about five minutes to completely N-chlorinate all of the available sites on the triazine molecule that can be N-chlorinated and to remove any N,N-dichloro exocyclic nitrogens;

cooling the reaction medium to precipitate [(monotrichloro) tetra-(monopotassium dichloro)] penta-isocyanurate; and

recovering crystalline [(mono-trichloro) tetra(monopotassium dichloro)] penta-isocyanurate.

4,103,089

α-ACETYLENE AND α-VINYL DERIVATIVES OF AMINO ACIDS

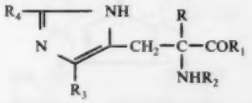
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,268

Int. Cl.[2] C07D *233/64*

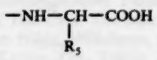
U.S. Cl. 548—344 **10 Claims**

1. A compound of the formula

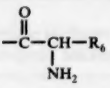


wherein R is —CH=CH_2 or —CH=CH; each of R_3 and R_4 is hydrogen, halogen selected from fluorine, chlorine, bromine and iodine or a straight or branched lower alkyl group of from 1 to 4 carbon atoms and can be the same or different with the proviso that when both R_3 and R_4 are halogen R_3 and R_4 are the same; R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, —$NR_{11}R_{12}$ wherein each of R_{11} and

R_{12} is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms or



wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_6 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; with the proviso that when R is $—CH=CH_2$, R_1 is hydroxy and R is hydrogen; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,103,090

STABILIZATION WITH ALKALI METAL ACETATE MATERIAL OF CERTAIN THERMALLY UNSTABLE DMT

Horace Edward Hood, Cecil County, Md., assignor to Hercofina, Wilmington, Del.

Filed Mar. 2, 1976, Ser. No. 663,171

Int. Cl.[2] C07C *67/50*

U.S. Cl. 560—3 **8 Claims**

1. A thermally stable composition consisting essentially of (1) thermally unstable fresh dimethyl terephthalate of extremely high purity, free of alkali metal compound material, having no significant concentration of either phosphonic acid moiety or phosphite moiety, and produced by the cooxidation-esterification process, and (2) dispersed therein at a stabilizing concentration, alkali metal acetate material.

4,103,091

METHOD FOR THE PREPARATION OF PROSTAGLANDIN INTERMEDIATES FROM A MOLD METABOLITE

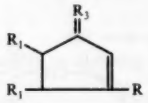
Lester Allen Mitscher; George Winfred Clark, III, both of Lawrence, Kans., and Gordon Herman Bokelman, Vancouver, Canada, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 611,468, Sep. 8, 1975, abandoned. This application Jul. 22, 1976, Ser. No. 707,726

Int. Cl.[2] C07C *69/38, 69/78*

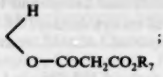
U.S. Cl. 560—106 **5 Claims**

1. A cyclopentene of the formula:



wherein R is —Ch=CHCHO, —CHOH—CHOH—CH_3, —CH=CHCH$_3$ or —CH=Ch—$CR_5(CH_2)_4CH_3$ with R_5 being =O or

both R_1 are benzoyloxy or acetoxy; R_3 is



and R_7 is a loweralkyl moiety.

4,103,092

WATER-SOLUBLE QUATERNARY AMMONIUM NON-HETEROCYCLIC AZO DYESTUFFS

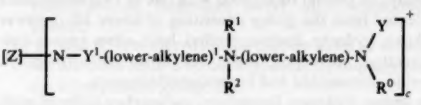
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 332,511, Feb. 14, 1973, Pat. No. 3,935,182, and Ser. No. 486,180, Jul. 5, 1974, Pat. No. 3,996,282, which is a continuation-in-part of Ser. No. 51,690, Jul. 1, 1970, Pat. No. 3,839,426, said Ser. No. 332,511, is a continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, Jul. 1, 1970, Pat. No. 3,709,903, said Ser. No. 51,676, and Ser. No. 51,690, each is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 531,868, May 23, 1966, abandoned. This application Jul. 14, 1975, Ser. No. 595,864

Int. Cl.[2] C09B *35/08, 35/22, 35/24, 35/26*

U.S. Cl. 260—175 **153 Claims**

1. A compound of the formula



c An$^-$

wherein:

c is an integer from one to two;

R^0 is hydrogen, lower-alkyl or hydroxy-lower-alkyl;

R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;

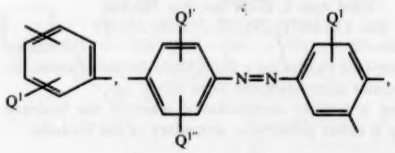
R^2 is lower-alkyl; lower-alkenyl, hydroxy-lower-alkyl or —(lower-alkylene)—NR^0Y;

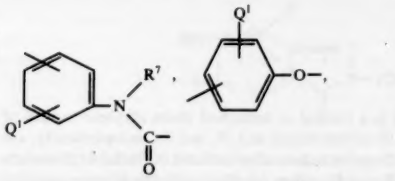
Y is hydrogen or

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower-alkyl;

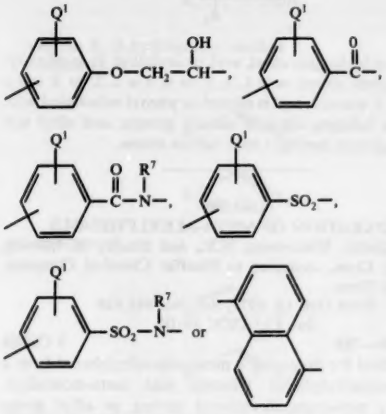
An is an anion;

Y^1 is a divalent radical of the formula





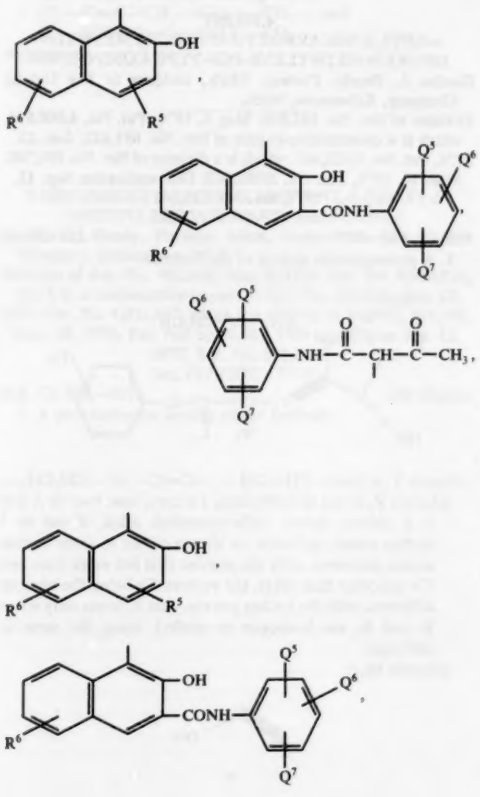
-continued



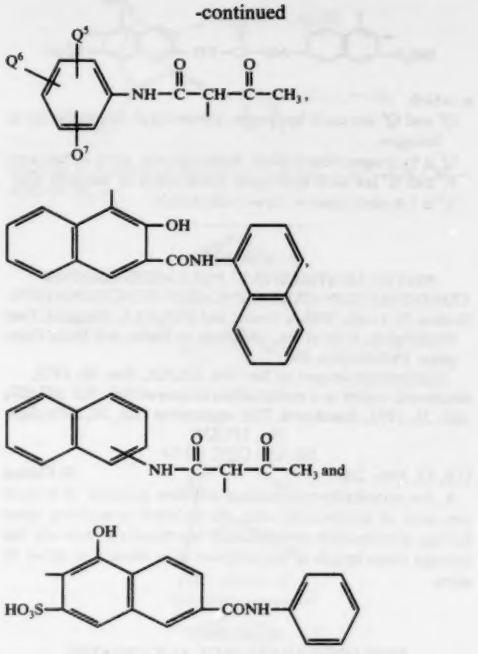
in which

Q^1, $Q^{1'}$ and $Q^{1''}$ are each hydrogen, lower-alkyl, lower-alkoxy or halogen, and R^7 is hydrogen, lower-alkyl or cyano-lower-alkyl; and

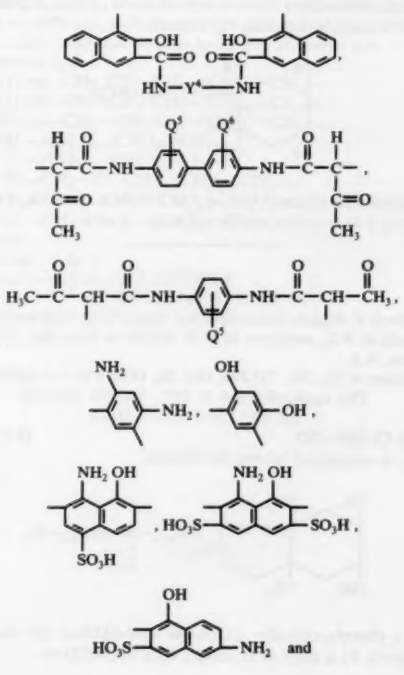
Z is an azoic coupling radical which, when c is one, is selected from the class having the formulas



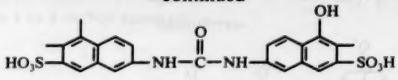
-continued



and, when c is 2, is selected from the class having the formulas



-continued



in which

Q^5 and Q^6 are each hydrogen, lower-alkyl, loweralkoxy or halogen;

Q^7 is hydrogen, lower-alkyl, lower-alkoxy, nitro or halogen;

R^5 and R^6 are each hydrogen, lower-alkyl or halogen; and

Y^4 is 1,4-phenylene or (lower-alkylene)[1].

4,103,093

NOVEL METHACRYLIC POLYMERS HAVING CONDENSATION-CROSSLINKABLE FUNCTIONALITY

Sheldon N. Lewis, Willow Grove, and Richard A. Haggard, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 371,921, Jun. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 137,057, Apr. 23, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,337

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—205 **26 Claims**

1. An anionically-polymerized addition polymer of at least one ester of methacrylic acid, the polymer comprising mers having condensation-crosslinkable functionality, wherein the average chain length of the polymer, *n*, is about 6 to about 50 mers.

4,103,094

CYCLOHEXANETETROL ALKANOATES

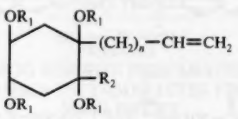
Frederic P. Hauck, Somerville, and Rita T. Fox, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1977, Ser. No. 795,465

Int. Cl.[2] C07D *69/12*

U.S. Cl. 560—231 **2 Claims**

1. A compound having the formula



wherein R_1 is alkanoyl having 1 to 7 carbon atoms; R_2 is alkyl having 1 to 6 carbon atoms; and *n* is 1, 2 or 3.

4,103,095

CYCLITOLAMINES

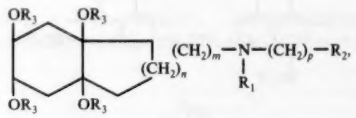
Frederic P. Hauck, Somerville, and Joyce Reid, Highland Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 735,855, Oct. 26, 1976, Pat. No. 4,065,485. This application Jul. 5, 1977, Ser. No. 813,196

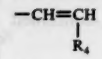
Int. Cl.[2] C07C *93/00, 93/24*

U.S. Cl. 560—252 **15 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein R_1 is alkyl or arylalkyl; R_2 is —C≡CH or



wherein R_4 is hydrogen, alkyl, aryl, or arylalkyl; R_3 is alkanoyl of 1 to 7 carbon atoms; *m* is 1, 2, 3, or 4; *n* is 1, 2, or 3; and *p* is 0, 1, 2, or 3; wherein aryl is phenyl or phenyl substituted with one or two halogen, alkyl or alkoxy groups; and alkyl and alkoxy are groups having 1 to 6 carbon atoms.

4,103,096

PREPARATION OF META-ALKYLPHENOLS

Silvio L. Giolito, Whitestone, N.Y., and Stanley B. Mirviss, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 13, 1977, Ser. No. 841,626

Int. Cl.[2] C07C *39/06*

U.S. Cl. 568—783 **9 Claims**

1. A method for preparing a meta-monoalkylphenol from a nonmeta-monoalkylphenol wherein said meta-monoalkylphenol is a meta-monoalkylphenol having an alkyl group which contains from about 2 to about 12 carbon atoms which comprises contacting said nonmeta-monoalkylphenol with trifluoromethane sulfonic acid at a concentration ranging from about 0.01 to about 5% by weight of alkylphenol at a temperature ranging from about 120° C to about the reflux temperature of said meta-monoalkylphenol for a period of time sufficient to convert at least a portion of said nonmeta-monoalkylphenol to meta-monoalkylphenol.

4,103,097

ω-ARYL-2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

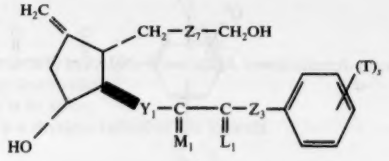
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,241

Int. Cl.[2] C07C *177/00*

U.S. Cl. 568—807 **211 Claims**

1. A prostaglandin analog of the formula



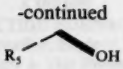
wherein Y_1 is trans—CH=CH—, —C≡C—, or $—CH_2CH_2—$,

wherein Z_3 is oxa or methylene, *s* is zero, one, two or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to three carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl, the various T's being the same or different, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein M_1 is

or

-continued



wherein R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, and
wherein Z_7 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—, and
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,
wherein g is one, 2, or 3.

4,103,098

2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

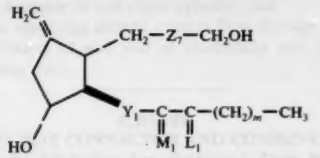
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,247

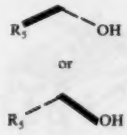
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 568—838 **211 Claims**

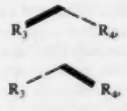
1. A prostaglandin analog of the formula



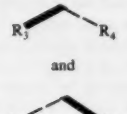
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—,
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, and
wherein Z_7 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—, or
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,
wherein
g is one, 2, or 3.
wherein m is one to 5, inclusive.

4,103,099

ELECTRIC FURNACES

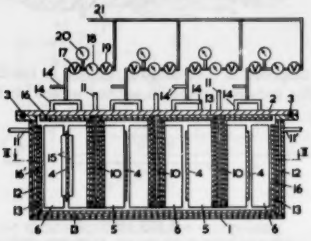
Peter James Allsopp, Streatley, England, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 24, 1976, Ser. No. 669,970

Claims priority, application United Kingdom, Mar. 25, 1975, 12505/75

Int. Cl.[2] F27D *11/04*

U.S. Cl. 13—7 11 Claims



1. An electric furnace for impregnating a porous carbon body by deposition of carbon from a gas comprising a heater element which, in use, the body is adapted to contact, a surface arranged to be cooled facing said heater element, and a layer of insulating material covering the cooled surface and facing the heater element in order to reduce the thermal gradient across the body.

4,103,100

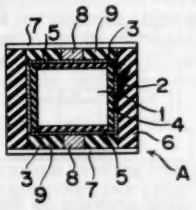
CELL ADAPTED FOR PRODUCING HIGH TEMPERATURES AND HIGH PRESSURES

Takahiko Kabayama, Kamakura; Masaru Ogata, Hatano, and Tetsuro Ikezawa, Isehara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,855

Int. Cl.[2] F27D *11/02*

U.S. Cl. 13—20 6 Claims



1. A cell adapted for producing high temperatures and high pressures comprising, an electrically insulating inner cylinder;

a pair of electrically insulating discs disposed at the upper and lower ends of said inner cylinder, respectively, thereby forming a sealed chamber for containing samples therein;

a heater means including a conductive intermediate cylinder disposed on said inner cylinder, and a pair of conductive discs disposed on said pair of electrically insulating discs at both ends of said intermediate cylinder, the diameter of said conductive discs being equal to the outside diameter of said intermediate cylinder;

an electrically and thermally insulating outer cylinder disposed on said intermediate cylinder;

a pair of electrically and thermally insulating discs, each having an electric contact, disposed on said pair of conductive discs, respectively, the diameter of said electrically and thermally insulating discs being equal to the inside diameter of said outer cylinder; and

means for supplying electric current flow through the electric contacts of said pair of electrically and thermally insulating discs.

4,103,101

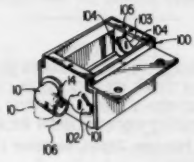
OUTLET BOX CONNECTOR AND COMBINATION

William Maier, 409 Bishop Ave., Bridgeport, Conn. 06610

Filed Mar. 28, 1977, Ser. No. 781,862

Int. Cl.[2] H05K *5/02*

U.S. Cl. 174—65 R 16 Claims



9. An electrical outlet box cable connector for use with an electrical outlet box having a wall provided with a substantially circular opening and with diametrically opposed arcuate recesses in the edge of the opening, said connector comprising a tubular body, an annular shoulder provided on said body for abutting the outer surface of the box wall, a pair of arcuate lugs provided at diametrically opposite sides of the connector for passage through the recesses of the box when the connector is inserted in the opening, said lugs being axially spaced from said annular shoulder so that said lugs will engage the inner surface of the box wall when the connector is rotated in the opening to a fastened position to retain the connector and box in assembled relation, portions of said tubular body between said lugs and said annular shoulder being raised to exceed the diameter of the opening in the box wall, whereby said raised portions may become wedged against the edge of the opening when the connector is rotated to its fastened position, the improvement wherein said raised portions include a pair of diametrically opposed arcuate raised portions and a pair of diametrically opposed flat raised portions, the flat raised portions being continuations of said arcuate raised portions and providing a raised surface of increasing diameter as the connector is rotated in the opening toward its fastened position to limit rotation of the connector in the opening.

4,103,102

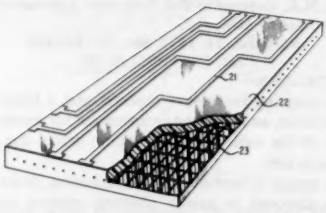
REINFORCED FLEXIBLE PRINTED WIRING BOARD

Theodore Harold Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 1, 1976, Ser. No. 701,591

Int. Cl.[2] H05K *1/00*

U.S. Cl. 174—68.5 4 Claims



1. A reinforced flexible printed wiring board comprising a

resin impregnated woven fabric upon which a metallic circuit configuration is defined:

(a) said woven fabric comprising a yarn of at least one continuous glass fiber twisted relatively about at least one continuous polyester fiber with a periodicity between 0.1 and 10 twists per inch, said glass fiber coated with a lubricant;

(b) said resin being a flexible resin which is at least partially cured, said resin impregnated fabric having insulation resistance greater than 1×10^9 ohms, propagation tear strength greater than 0.5 pounds, and dimensional stability greater than 2 mils per inch; and

(c) said metallic circuit configuration having a peel strength greater than three pounds per inch of conductor width.

4,103,103

ELECTRICAL INSULATORS HAVING SEMI-CONDUCTING GLAZE AND CONDUCTIVE PORTLAND CEMENT CONTAINING A SPECIFIED AMOUNT OF CARBON BLACK

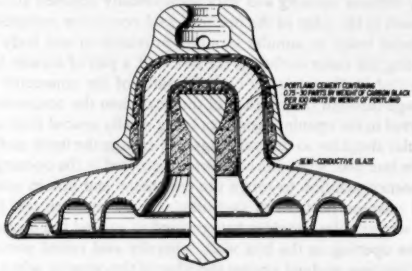
Toshiko Hizikata, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 18, 1976, Ser. No. 733,171

Claims priority, application Japan, Aug. 10, 1976, 51/94548

Int. Cl.[2] H01B *17/42, 17/50*

U.S. Cl. 174—140 C **6 Claims**


PORTLAND CEMENT CONTAINING
0.75 - 3.0 PARTS BY WEIGHT OF CARBON BLACK
PER 100 PARTS BY WEIGHT OF PORTLAND CEMENT
SEMI-CONDUCTIVE GLAZE

1. An electrical insulator having a semi-conducting glaze, which comprises an insulating body with its surface coated with a semi-conducting glaze, metal fittings and conductive cement composition filled between said insulating body and said metal fittings and in electrical contact with both said semi-conducting glaze and said metal fittings, said conductive cement composition containing 0.75 - 3.0 parts by weight of carbon black having bulk density, carbon purity and specific gravity which correspond to those of acetylene black per 100 parts by weight of Portland cement, the conductivity of the cement composition being substantially given by the carbon black only.

4,103,104

ANCHOR ASSEMBLY FOR A SUBMARINE CABLE COUPLING

Francis Joseph Spollen, Middletown Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

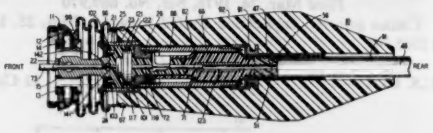
Filed Jul. 14, 1977, Ser. No. 815,601

Int. Cl.[2] H02G *15/14*

U.S. Cl. 174—70 S **7 Claims**

1. In a coupling between a repeater and a front end of a submarine cable, an improved arrangement for terminating the front end of the cable inner conductor within the coupling, which comprises:

anchor means comprising, in combination, front and rear discs disposed in axially abutting relation and having aligned central apertures extending axially therethrough, each of the discs being formed from a first insulating material, an elongated conductive element extending coaxially through the central apertures of the discs for receiving the front end of the inner conductor, and a conductive nut coaxially secured to the front end of the conductive element and having a rear surface abutting the front surface of the front disc; and



means disposed in surrounding relation to the discs and the nut for encapsulating the anchor means within the coupling.

4,103,105

SWITCHING SIGNAL GENERATOR

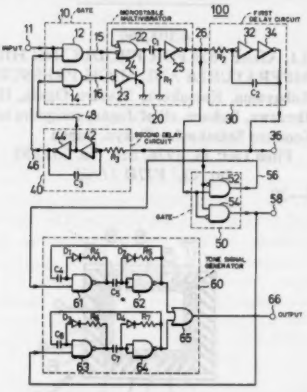
Masaki Akiyama, and Okie Tani, both of Tokyo, Japan, assignors to Tani Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,332

Claims priority, application Japan, Dec. 26, 1975, 50-178160[U]; Dec. 26, 1975, 50-157459; Dec. 26, 1975, 50-157460; Dec. 26, 1975, 50-157461

Int. Cl.[2] H04H *1/04;* **H04M** *1/60;* **H04B** *1/00*

U.S. Cl. 179—1 VC **3 Claims**



1. Switching signal generator for transmit-receive circuit changing of radio telephone equipment comprising:

an electroacoustic transducer for generating an electric pulse signal from an acoustic pulse signal produced by a particular vocalization of said operator;

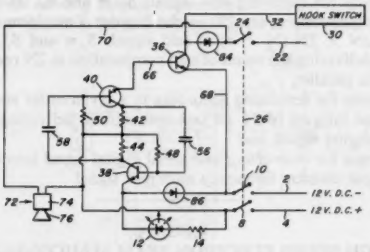
regenerative switching circuit means, the output logic state of said regenerative switching circuit means being changed from one logic state to another logic state by said electric pulse signal; and

tone signal generator means for generating two characteristic tone signals for a predetermined duration indicating the changeover of said output logic state, said tone signals being of two mutually different frequencies, one frequency being generated for indicating the changeover of said regenerative switching circuit from the first logic state to the second logic state and the other frequency being generated for indicating the changeover of said regenerative switching circuit from the second logic state to the first logic state.

4,103,106
MOBILE RADIOTELEPHONE APPARATUS AND METHOD

Charles J. Sechan, 814 Grandview Ave., Pittsburgh, Pa. 15211

Filed Sep. 13, 1976, Ser. No. 722,772
Int. Cl.[2] H04Q 7/04; H04B 7/26
U.S. Cl. 179—2 EB 25 Claims



1. A mobile radiotelephone device comprising

telephone control means for controlling operation of a mobile radiotelephone including supervisory logic means,

channel finding means for initiating through said supervisory logic means operation of channel seeking action,

said channel finding means including

signal generating means for cyclically emitting a signal,

signal communication means responsive to said signal generating means to cyclically deliver a reduced voltage signal to said supervisory logic means, said supervisory logic means having means for emitting a reduced voltage signal responsive to simultaneous receipt of said reduced voltage signal from said signal communication means and a signal indicating that an idle channel is available,

channel available means for initiating an audible or visual signal responsive to a signal from said supervisory logic means indicating that an idle channel has been seized,

whereby said channel finding means will cyclically deliver a reduced voltage signal to said supervisory logic means and thereby provide an indication that an effort to initiate a call is to be made and if said telephone has locked in an available channel said supervisory logic means will emit a low voltage signal to said channel available signal means and said channel finding will have been initiated and completed without the need to remove the telephone handpiece from its cradle.

4,103,107
PAGING ENCODER SYSTEM UTILIZING A TELEPHONE LINE LINK

Thomas Victor D'Amico, Lauderhill; Mark Henry Rackin; Victor Jensen, both of Sunrise; Norman Eugene Schultz, North Lauderdale; John Joseph Cady, Sunrise; William John Macko, Lauderdale Lakes; Carl Raymond Steinbach, and Nicholas Petrakos, both of Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 9, 1977, Ser. No. 776,023
Int. Cl.[2] H04M 11/00
U.S. Cl. 179—2 EC 3 Claims

1. In a system for transmitting dual tone, multi-frequency encoded paging signals and audio frequency signals over a voice-pair of telephone lines to a remote terminal, an encoder comprising:

transducer means for two-way audio signal conversion;

keyboard means for inserting data and command signals;

memory means for storing data signals inserted by said keyboard means;

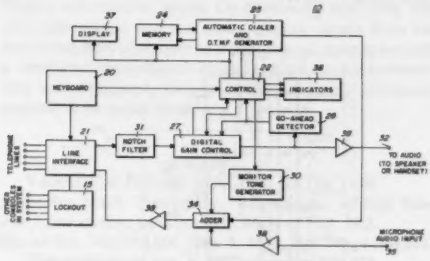
interface means coupled to said telephone lines;

first logic circuit means for encoding the inserted data signals into dual tone, multi-frequency output signals for transmission over said telephone lines;

digital gain the interface means for controlling means coupled to control the level of the audio signals received from the telephone lines, the controlled signals being coupled to the transducer means;

tone generator means for providing a monitor signal in response to a predetermined received signal, said monitor signal being higher in frequency than any of said dual tone frequencies;

adder means for combining the output signals of the transducer, the first logic circuit means and the tone generator means, said combined signals being coupled to the input of said interface means;



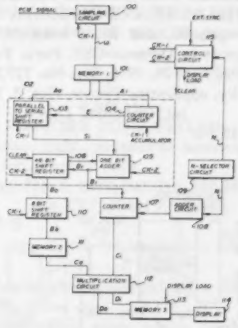
detect means coupled to the digital control means for detecting the predetermined frequency signal in said received audio signal; and

control circuitry coupled for receiving the output of the keyboard means, coupled for storing said inserted data signals in the memory means, and coupled to the detect means for receiving the predetermined received signal and in response thereto activating the tone generator means, for controlling access to said inserted data signals in response to said inserted command signals from the keyboard means, and coupled to the first logic circuit means for enabling the transmission of the output signals thereof.

4,103,108
CIRCUIT AND METHOD FOR DIGITALLY MEASURING SIGNAL LEVELS OF PCM ENCODED SIGNALS

Ernst August Munter, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 4, 1977, Ser. No. 774,381
Int. Cl.[2] H04J 3/14
U.S. Cl. 179—15 BF 7 Claims



1. A digital circuit for measuring the level of a PCM signal representing an analogue signal and encoded in accordance with a predetermined companding law, comprising:

a selector means having positions 0–*n*;

a sampling circuit for successively sampling said PCM signal 2^n times, n being determined by said selector means;

means for converting each of said samples to its normalized power representation;

means for computing the average power of said samples; and

means for determining the power level number of said average power.

4,103,109

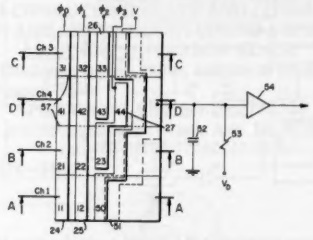
CCD MULTIPLEXER

Dale G. Maeding, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 30, 1977, Ser. No. 782,813

Int. Cl.[2] H04J *3/04*

U.S. Cl. 179—15 A **9 Claims**



1. A CCD multiplexing device for converting individual signals fed simultaneously to a plurality of parallel channels into a serial output, said parallel channels being isolated from each other so as to prevent the transfer of charge between contiguously adjacent ones of said parallel channels, comprising the combination:

delay means comprising said plurality of parallel channels, for delaying charge packets fed into said device at predetermined time durations;

clocking means, coupled to the delay means, for providing transfer capability to said charge packets between said delay means; and

summing means, coupled to said plurality of channels, for converting a plurality of charge packets fed to said device in parallel mode to a sequential output of said charge packets without inter-transfer of any of the charge packets between the paralled channels.

4,103,110

TELEPHONE TRANSMISSION SYSTEM COMPRISING DIGITALLY PROCESSING FREQUENCY MULTIPLEXOR AND DEMULTIPLEXOR

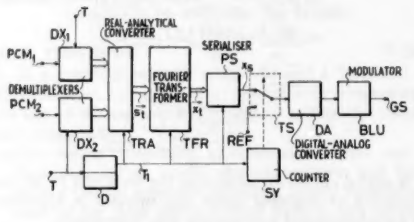
Jean-Edgar Picquendar, and Boris Sokoloff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 28, 1976, Ser. No. 727,540

Claims priority, application France, Oct. 2, 1975, 75 30234

Int. Cl.[2] H04J *1/18*

U.S. Cl. 179—15 FD **12 Claims**



1. An apparatus for multiplexing a set of n incoming signals arriving respectively on n input telephone channels into an output frequency division multiplex signal going out on an output channel, said apparatus comprising:

means for processing said incoming signals, providing every T μs n complex signals S_r, $m = \frac{1}{2}[(f_r, k+f_i+T, k) + j(F_r, k-f_r, k-f_i+T, k)]$ and n conjugate complex signals S_i^*, $m = \frac{1}{2}[(f_r, k+f_i+T, k) - j(f_r, k-f_i+T, k)]$, and delivering said signals S_r, m and S_i^*, m;

means for receiving said signals S_r, m and S_i^*, m, ditigally computing every 2T μs the Fourier Transform of order $2N \times 2N$ ($N < n$) of said signals $S_r m$ and S_i^*, m, and delivering the result of said computation as 2N real signals in parallel;

means for serializing according to a given order and during an interval of 2T μs said real signals, delivering a serial digital signal; and

means for converting said serial digital signal into said output division frequency multiplex signal.

4,103,111

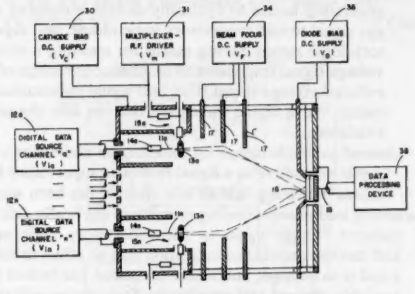
HIGH SPEED ELECTRON BEAM SEMICONDUCTOR DIGITAL MULTIPLEXER

Ali Bahraman, Redondo Beach, and Walter E. Crandall, Malibu, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed May 26, 1977, Ser. No. 800,935

Int. Cl.[2] H04J *3/04*

U.S. Cl. 179—15 A **16 Claims**


CATHODE BIAS D.C. SUPPLY
MULTIPLEXER - R.F. DRIVER
BEAM FOCUS D.C. SUPPLY
DIODE BIAS D.C. SUPPLY
DIGITAL DATA SOURCE CHANNEL "n"
DIGITAL DATA SOURCE CHANNEL "1"
DATA PROCESSING DEVICE

1. A system for time multiplexing together the digital signal outputs of a plurality of digital data sources comprising:

means for generating a plurality of electron beams, each of said beams providing a carrier for a separate data channel,

means for modulating each of said beams with a separate one of said digital data source outputs,

an electron sensitive target,

means for sequentially gating said beams, and

means for focusing each beam onto said target at times when each such beam is being gated and a predetermined digital output is modulating such beam,

whereby said target receives the digital data source outputs in time multiplexed form.

4,103,112

TELEPHONE LINE CIRCUIT WITH DIFFERENTIAL LOOP CURRENT SENSING AND COMPENSATION

Vincent Viacheslav Korsky, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 17, 1977, Ser. No. 842,420

Int. Cl.[2] H04Q *1/28*

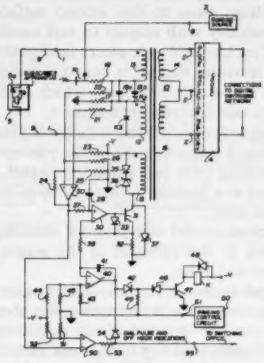
U.S. Cl. 179—18 FA **5 Claims**

1. A telephone line circuit for interfacing a subscriber loop to an associated telephone switching facility, the telephone line circuit comprising:

power and ground terminals for connection to a source of power;

a transformer including a core of saturable magnetic material, a first winding for connection across the tip and ring leads of the subscriber loop and to said terminals, a second winding for connection to the switching facility and a balancing winding, the core material being limited in bulk to that sufficient to transmit typical alternating current voice signals between the first and second windings and to saturate in the presence of larger alternating current signals;

a current sensing circuit responsive to current flow in the subscriber loop for generating a signal proportional to the



sum of the direct current components in the tip and ring leads;

current regulation means connected in series with the balancing winding and the power and ground terminals, and responsive to the signal from the current sensing circuit to conduct current via the terminals and the balancing winding in an amount sufficient to substantially cancel the direct current flux of the first winding;

whereby abnormally large pulse signals and the like cause the core material to saturate and impede transmission of signals between the first and second windings.

4,103,113

ATTENDANT CONSOLE CONTROL SYSTEM

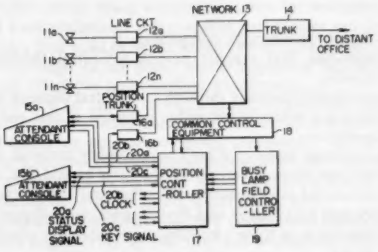
Kazuhiro Sato, Yokohama; Nobuyuki Yasoshima, Zama; Toru Masuda, Fujisawa, all of Japan; Makoto Fujisawa, Montebello, Calif., and Yasuo Satake, Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 19, 1977, Ser. No. 788,972

Claims priority, application Japan, Apr. 24, 1976, 51-46900

Int. Cl.[2] H04M *3/22*

U.S. Cl. 179—27 CA **28 Claims**



1. An attendant console control system connected to a telephone network comprising a plurality of telephones having various statuses, said system comprising:

an attendant console having a plurality of keys operable to enter key information into said attendant console, and an indicative portion for visually displaying status information as to said telephones, said attendant console including means for passing said key information in bit serial form;

a position controller for receiving and passing said key information;

a common control equipment connected to said telephone network and responsive to changes in the status of each of said plurality of telephones for providing corresponding update information; and

a busy lamp field controller for maintaining status information as to each of said plurality of telephones, responsive to said update information for updating said status information, and responsive to said key information for providing status display signals for displaying said status information corresponding to said key information;

said position controller including means for providing lamp display information, means for combining said lamp display information and said status display signals from the busy lamp field controller in a time-shared manner to form a combined, time-shared signal, and means for transmitting said combined, time-shared signal to the attendant console in bit serial form.

4,103,114

VARIABLE DELAY RINGING DETECTOR

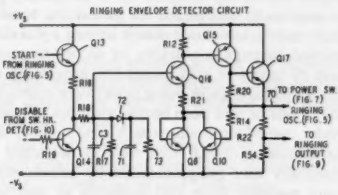
Barry Sheldon Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 638,164, Dec. 5, 1975, Pat. No. 4,048,551.

This application Jun. 6, 1977, Ser. No. 803,554

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—84 R **2 Claims**



1. A variable delay ringing detector comprising

switching means responsive to ringing signals for supplying a charging current,

a first capacitor connected to receive said charging current directly,

a second capacitor connected to receive said charging current through a unilateral conducting device,

a high impedance discharge path for said second capacitor, and

a ringing threshold detector responsive to the voltage on said first capacitor for indicating the presence of ringing signals.

4,103,115

MEMORY TONE DIALER

Paul Milkes, Encino, Calif., assignor to American Communication Systems, Inc., Encino, Calif.

Filed Jan. 3, 1977, Ser. No. 756,288

Int. Cl.[2] H04M *1/51*

U.S. Cl. 179—90 B **1 Claim**

1. A memory tone dialer for use with a telephone system comprising:

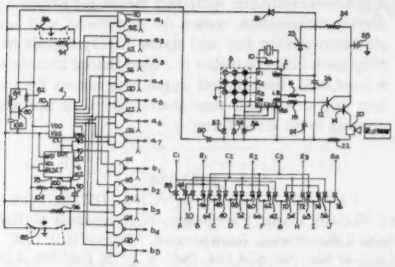
a keyboard, said keyboard comprising a plurality of push button key switches;

a means for generating tones which correspond to said switches of said keyboard;

a programmable means for remembering at least two sequences of numbers, said programmable means further causing said generating means to generate a sequence of tones

corresponding to one of said two sequences of numbers when at least one of said plurality of push button switches of said keyboard is operated and to generate a sequence of tones corresponding to another one of said two sequences of numbers when at least another one of said plurality of push button switches of said keyboard is operated; and

a means for coupling said generated tones to said telephone system, wherein said programmable means includes a clock circuit coupled to sequencing means for serially activating an ordered sequence of outputs of said sequencing means in response to said clock circuit, each said output being coupled to a logic gate with at least one of said outputs being coupled to more than one logic gate, said logic gates coupled to said outputs forming a plurality



of sets of logic gates wherein each set corresponds to one of said sequences of numbers, each logic gate having an output selectively coupled by a temporary plug board connection to said means for generating tones through a diode matrix, said diode matrix having a plurality of inputs coupled through a plurality of diodes to predetermined pairs of inputs to said means for generating tones, each said set of logic gates being selectively enabled by activation of one of said push button switches of said keyboard, whereby one of a plurality touch tone number sequences is automatically dialed, said number sequence being mechanically user programmable by selectively a one-to-many mapping from said sequence to said sets of logic gates and a many-to-one mapping from said sets of logic gates to said tone generating means.

4,103,116

PICKUP CARTRIDGE WITH MOVING MAGNET ARMATURE

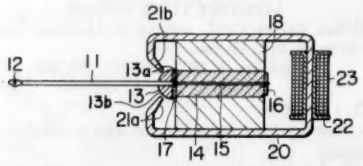
Hitoshi Mishima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 3, 1975, Ser. No. 637,149

Claims priority, application Japan, Dec. 5, 1974, 49-140345; Dec. 5, 1974, 49-140346; Dec. 5, 1974, 49-140347; Dec. 5, 1974, 49-140348

Int. Cl.[2] H04R *11/12*

U.S. Cl. 179—100.41 M **17 Claims**



1. A pickup cartridge comprising:

an armature formed as a permanent magnet;

a supporting member for supporting said armature magnet;

a damping member made with an elastic material for damping the movement of said armature magnet and positioned between said supporting member and a first surface of said armature magnet, which first surface facing said damping member;

a cantilever secured to said armature magnet and having its foremost end provided with a stylus tip and having its base end positioned at substantially the center of said first surface of the armature magnet;

position insuring means for insuring the position of the base end of said cantilever relative to said supporting member and permitting the free movement of said cantilever centering around said base end thereof;

pole pieces facing a second surface of said armature magnet at positions close to this second surface and arranged symmetrically with respect to said cantilever so that an area of each of said pole pieces facing said second surface of the armature magnet is constant irrespective of vibration of the armature magnet, which second surface does not face said damping members;

a yoke magnetically coupled to said pole pieces for constituting a closed magnetic path for the passage of the magnetic flux emitting from said armature magnet, said yoke being arranged at a specific position relative to said supporting member; and

a coil applied around said yoke for inducing a signal corresponding to the variation of the magnetic flux passing through said yoke,

said second surface of the armature magnet being a surface having a substantially constant radius of curvature centering around the base end of said cantilever,

said pole pieces pointing to the base end of said cantilever and having end faces thereof facing said second surface of the armature magnet at postions close to this second surface.

4,103,117

PICK-UP CARTRIDGE

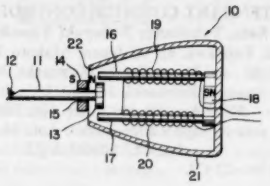
Mistuyoshi Morinaga, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,449

Claims priority, application Japan, Dec. 25, 1975, 50-157236

Int. Cl.[2] H04R *11/12*

U.S. Cl. 179—100.41 Z **2 Claims**



1. A pick-up cartridge comprising:

a plate-like first magnet having a central through hole therein;

a cantilever extending through said central through hole and having a reproducing stylus mounted at one end of said cantilever;

an armature made of a high permeability material and of a size and shape substantially the same as said first magnet, connected at its center to the other end of said cantilever, located adjacent to said first magnet, and supported by a damper so as to be vibratable with vibration of said cantilever;

a first pair of spaced coil-carrying elongated pole pieces each having a first end and a second end opposite said first end, wherein their respective first ends are located in the vicinity of and slightly spaced radially from said armature to define gaps therebetween; and

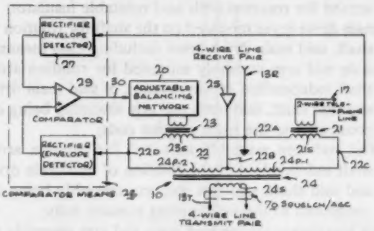
a plate-like second magnet connected to the respective second ends of said first pair of pole pieces, said first and

second magnets being arranged to have the same polarities oriented in the same directions.

4,103,118
AUTOBALANCE HYBRID CIRCUIT

Jay Richard Bergman, Santa Monica, Calif., assignor to Synanon Foundation, Inc., San Francisco, Calif.

Filed May 2, 1977, Ser. No. 792,817
Int. Cl.[2] H04B 1/58
U.S. Cl. 179—170 D **4 Claims**



1. An autobalance hybrid circuit for connecting a 4-wire telephone line having separate receive and transmit pairs to a 2-wire line, comprising:

a balancing network having an impedance that is adjustable in response to a control signal,

a bridge formed of (a) a 2-wire telephone line coupling transformer connected to said 2-wire line, (b) a balancing network coupling transformer connected to said network, and (c) the two sides of the center-tapped primary of an output transformer, the secondary of said output transformer being connected to the 4-wire line transmit pair,

the 4-wire line receive pair being connected across two nodes of said bridge, between the center tap of said output transformer primary and the junction connecting said coupling transformers, and

comparator means, connected to the other two nodes of said bridge at the junctions connecting the ends of said center-tapped primary with the respective coupling transformers, for comparing the envelope voltages developed across said two coupling transformers in the bridge, and for providing a control signal to said balancing network which causes adjustment thereof so as to equalize said voltages, said hybrid circuit in this manner compensating for changes in the impedance of said 2-wire telephone line and preventing any audio input from said 4-wire line receive pair from being returned via said output transformer onto said 4-wire line transmit pair, said comparator means comprising:

a first rectifier circuit having a low threshold, said first rectifier circuit being connected across the secondary of said 2-wire telephone line coupling transformer and developing a first voltage signal indicative of the magnitude of the envelope of an audio signal appearing across that 2-wire telephone line coupling transformer,

a second rectifier circuit having a low threshold, said second rectifier circuit being connected across the secondary of said balancing network coupling transformer and developing a second voltage signal indicative of the magnitude of the envelope of an audio signal appearing across that balancing network coupling transformer, and

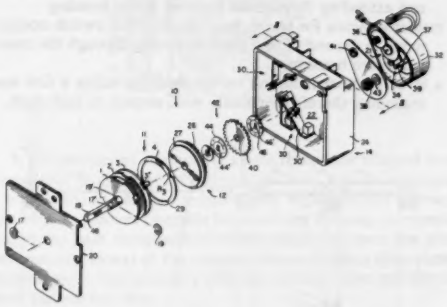
a differential amplifier having two comparison inputs connected respectively to said first and second rectifier circuits, said differential amplifier comparing said first and second voltage signals and producing a control signal indicative of the difference therebetween, the output of said differential amplifier being connected to said balancing network so as to provide said control signal therto, together with

a squelch circuit connected between the secondary of said output transformer and said 4-wire line transmit pair, the threshold of said squelch circuit being set so that squelch occurs whenever the audio signals across said 2-wire telephone line coupling transformer and said balancing network coupling transformer both are below the threshold of the respective first and second rectifier circuits.

4,103,119
TIMING MECHANISM HAVING INDEPENDENTLY OPERATED PLURAL CAM ASSEMBLIES

William N. Homan, Plainfield, and Steve W. Smock, Indianapolis, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 12, 1976, Ser. No. 731,622
Int. Cl.[2] H01H 43/10
U.S. Cl. 200—35 R **7 Claims**



1. In a timing mechanism wherein at least two separate cam means are carried by a shaft and wherein a single motor drive means causes rotation of said two separate cam means, an improvement characterized by:

(a) a first cam means fixedly connected to said shaft and a first switch means engaging same to be opened and closed in response to a rotation of said cam means,

(b) a second cam means freely rotatably carried about said shaft and a second switch means engaging both said first and second cam means,

(c) a gear train coupled to said motor drive means, said gear train including first and second output pinions at separate stages thereof to provide two separate outputs at different speeds, and

(d) first coupling means coupling said first output pinion to said shaft and second coupling means coupling said second output pinion to said second cam means whereby said shaft and said first cam means are rotated at one speed and said second cam means is rotated simultaneously about said shaft at a different speed.

4,103,120
AUXILIARY MECHANISM FOR IMPARTING ROTATIONAL ENERGY TO ELECTRICAL COMPONENTS

John M. Jarosz, Chicago, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,742
Int. Cl.[2] H01H 31/00
U.S. Cl. 200—48 R **20 Claims**

1. A mechanism for imparting rotational energy comprising:

an output shaft mounted for rotation between a first and second position;

lever means mounted on the shaft for applying rotational forces to said shaft;

overcenter toggle linkage means connected to the lever means for preventing rotation of said output shaft from its first position when said overcenter toggle linkage is in an

overcenter toggle position and for causing said lever means to rotate said shaft to its second position when moved out of the overcenter toggle position;

force applying means for causing the overcenter toggle linkage means to move out of the overcenter toggle position and rotate said lever means and output shaft rapidly to its second position in such a manner that increased mechanical advantage is applied by said overcenter toggle linkage means during initial operation so that high initial torque forces are applied to said output shaft;

bias means for returning the overcenter toggle linkage means to the overcenter toggle position after said force applying means ceases applying a force thereby returning the output shaft to its first position.

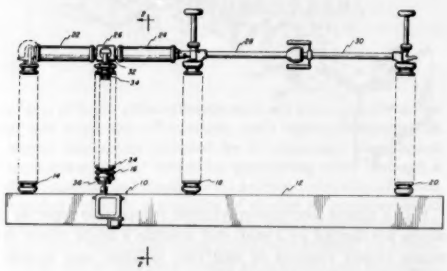
9. A mechanism for imparting rotational energy to electrical switch components comprising:

a housing;

a shaft mounted for rotation in the housing and having an end extending through an opening in the housing;

insulator means for connecting the electrical switch components to the end of said shaft extending through the opening in the housing;

a lever member mounted on the shaft including a first end extending therefrom radially with respect to said shaft;



a first link member pivotably mounted at one end to said first end of said lever member;

a bellcrank member mounted for rotation including first and second arms extending outwardly therefrom, said first arm being pivotably connected at its extended end to the other end of said first link member;

force applying means for applying a force;

means for connecting said force applying means to the extended end of said second arm;

bias means for urging said bellcrank member to rotate so that said first link and said first arm are normally positioned in an overcenter toggle position;

said force applying means applying the force to said means for connecting so that said bellcrank member rotates causing said first link member and said first arm to move out of the overcenter toggle position and pivot said lever member and shaft rapidly thereby imparting high initial torque rotational energy through said insulator means to the electrical switch components; and said bias means causing said bellcrank member to rotate in the opposite direction until said first link and said first arm are positioned in an overtoggle position thereby preventing accidental rotation of said shaft when said force applying means ceases to apply a force.

4,103,121

SWITCH OPERATING MECHANISM

Edward J. Rogers, Chicago, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,743
Int. Cl.[2] H01H *31/00*
U.S. Cl. 200—48 A **21 Claims**

1. In a high voltage switch arrangement, the switch arrangement comprising a base, supporting insulators mounted on the base, a first and a second current interrupter mounted on the supporting insulators, each current interrupter including main contact rods connected to separable main contacts that carry continuous high voltage current when closed and interrupting contact rods connected to separable interrupting contacts that interrupt high voltage current when separated, a rotatable insulator mounted on the base adapted for rotation by a driven mechanism; an improved switch operating mechanism comprising:

a housing;

a shaft rotatably mounted in the housing and extending through an opening in the housing, said shaft being connected for rotation with said rotatable insulator;

a main drive lever mounted on the shaft for rotation with the shaft, said main drive lever including cam means;

a main rod arm assembly mounted for rotation around the shaft independent of the rotation of said main drive lever and said shaft, said main rod arm assembly being operably connected to the main contact rods;

a fast rod arm assembly mounted for rotation around the shaft independent of the rotation of said main drive lever and said shaft, said fast rod arm assembly being operably connected to the interrupting contact rods;

first bias means urging said main rod arm assembly to rotate in a direction to cause the main contact rods to move to open the main contacts;

second bias means urging said fast rod assembly to rotate in a direction to cause the interrupting contact rods to move to open the interrupting contacts;

first overcenter toggle linkage means operably connected to said main rod arm assembly for preventing rotation of said main rod assembly when said first overcenter toggle linkage means is in an overcenter toggle position;

second overcenter toggle linkage means operably connected to said fast rod arm assembly for preventing rotation of said fast rod arm assembly when said second overcenter toggle linkage means is in an overcenter toggle position;

latch means mounted on said first overcenter toggle linkage means for engaging said cam means on said main drive lever when said main drive lever is rotated by said shaft and for moving said first overcenter toggle linkage means out of the overcenter toggle position so that said main rod arm assembly is rotated under the urging of said first bias means to open the main contacts;

means associated with said main rod arm assembly and positioned for engaging said second overcenter toggle linkage means after a predetermined amount of rotation of said main rod arm assembly when rotated to open the main contacts and for moving said second overcenter toggle linkage means out of the overcenter toggle position so that said fast rod arm assembly is rotated under the urging of said second bias means to open the interrupting contacts.

4,103,122

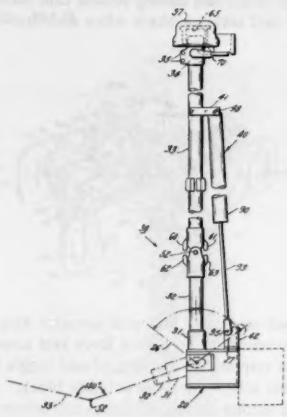
HIGH VOLTAGE GROUNDING SWITCH REQUIRING LOW OPERATING EFFORT

Roy H. Albright, Greensburg, and Walter B. Kelly, Laughlintown, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 24, 1976, Ser. No. 699,578
Int. Cl.[2] H01H *31/00*
U.S. Cl. 200—48 P **10 Claims**

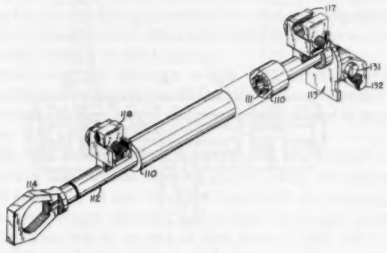
1. A high voltage grounding switch comprising, in combination: a support base; a rotatable switch blade consisting of first and second elongated blade sections pivotally connected to one another at adjacent ones of their ends; a fixed jaw contact spaced from said support base by a fixed distance; the opposite end of said first blade section being rotatably mounted on said support base; a telescoping contact means connected to the opposite end of said second blade section and adapted to slidingly axially engage and disengage said jaw contact when said rotatable switch blade is operated between an engaged and

disengaged position; blade rotating means connected to said first blade section for rotating said blade between an engaged and disengaged position relative to said fixed jaw contact; stop means connected to said first and second blade sections to define a minimum included angle between their axes of less



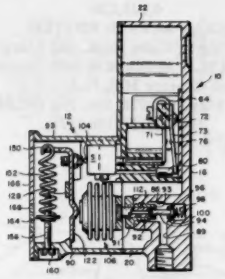
than about 170° and more than about 120°; second stop means on said jaw contact for receiving and stopping the angular movement of said blade as said blade approaches said fixed jaw contact; and biasing means connected between said first and second blade sections for holding said blade sections in a collapsed-toggle position relative to one another.

4,103,123
GROUNDING DEVICE
Lloyd B. Marquardt, Jr., Aberdeen, S. Dak., assignor to Northwestern Public Service Company, Huron, S. Dak.
Filed Jun. 27, 1977, Ser. No. 810,191
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 R **4 Claims**



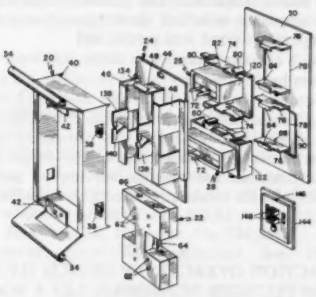
1. A grounding device dimensionally interchangeable with a switch blade in high voltage electrical distribution systems comprising, in combination:
an elongated member of electrically insulating material;
a first electrically conductive member, at one end of said elongated member, configured like the lower terminal of a switch blade;
a second electrically conducting member, at the other end of said elongated member, configured like the upper terminal of a switch blade;
and means carried by each of said conducting members for connecting an electrical conductor thereto.

4,103,124
PLUG-IN PRESSURE SWITCH
Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.
Filed Dec. 20, 1976, Ser. No. 752,028
Int. Cl.² B65D *35/32*
U.S. Cl. 200—51 R **23 Claims**



1. An instrument comprising a base receptacle adapted to be connected to air pressure and electric lines, a plug-in receptacle embodying pressure-sensitive and switch means operable thereby, and means operable by mounting the plug-in receptacle to the base receptacle to automatically connect the pressure-sensing means to the pressure line and, when dismounted therefrom, to automatically close the pressure line and disconnect the electric line.

4,103,125
MODULAR ELECTRICAL SWITCH/OUTLET ASSEMBLY
Louis Marrero, 1209 Via Ramon, Escondido, Calif. 92025
Filed Apr. 15, 1977, Ser. No. 788,514
Int. Cl.² H01R *13/70*
U.S. Cl. 200—51 R **12 Claims**



1. A modular electrical switch/outlet assembly comprising:
(a) a wiring box having connections for incoming power wires and having a plurality of spaced contact pairs coupled to said connections;
(b) mounting means for said wiring box to mount same to a building member;
(c) at least one switch module having contacts dimensioned and positioned to mate alternatively with any of said contact pairs;
(d) at least one receptacle module having contacts positioned and dimensioned to mate alternatively with any of said contact pairs, whereby said assembly can provide a plurality of different switch and receptacle combination;
(e) a face plate having a plurality of openings and each of said openings having mounting means to alternatively

engage a selected one of a plurality of said modules in any desired combination; and

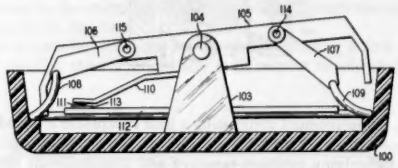
(f) said mounting means for said modules being brackets extending rearwardly from said face plate and which cooperate with complimentary means on said modules such that the latter make a snap-on connection with said module mounting brackets.

4,103,126

SNAP ACTION SWITCH

Ernest Gerard DeNigris, Colts Neck, and Merle Victor Olsen, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1976, Ser. No. 687,694
Int. Cl.[2] H01H *5/14*
U.S. Cl. 200—67 C **14 Claims**



1. A switch mechanism comprising:

a frame element;

a switch actuator pivotally attached to said frame element;

first arm means one end of which is connected to said switch actuator and laterally displaced to one side of said pivotal attachment;

second arm means one end of which is connected to said switch actuator and laterally displaced to the other side of said pivotal attachement from said first arm means connection and in force opposition to said first arm means;

first torsion spring means pivotally connected to the other end of said first arm means for applying a first force to said switch actuator through said first arm means;

second torsion spring means pivotally connected to the other end of said second arm means for applying a second force opposing said first force to said switch actuator through said second arm means; and

said switch actuator having two stable positions, each stable position having one arm means extended in a straight line relationship with respect to the associated said torsion spring means and one arm means flexed in an angular relationship with respect to the associated said torsion spring means and wherein said applied forces in said two stable positions are unequal serving to maintain said switch actuator in an established stable position.

4,103,127

SNAP-ACTION OVERCENTER SWITCH HAVING AN APEXED PLUNGER DEPRESSIBLE IN A ROCKABLE ACTUATOR BLOCK AND OPERATED BY A TOGGLE LEVER HAVING A POSITIVE OFF CAM

Harold W. Hults, New Berlin, and Werner B. Halbeck, Mequon, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 9, 1976, Ser. No. 694,387
Int. Cl.[2] H01H *5/10*
U.S. Cl. 200—67 G **3 Claims**

1. A snap-action electric toggle switch comprising:

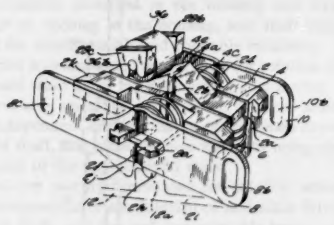
housing means;

an actuator block pivotally mounted in said housing means;

an apexed plunger carried by said actuator block for pivotal movement therewith and depressible therein transversely of the pivotal axis thereof;

means biasing said plunger outwardly of said actuator block;

a toggle lever pivotally mounted to said housing means about an axis parallel to said pivotal axis of said actuator block and having first cam means engaging said plunger against the bias of said biasing means and translationally movable across the apex thereof to cause snap-action overcenter pivoting of said actuator block when said first cam means crosses said apex in response to pivoting of said toggle lever, and having second cam means engageable with said actuator block when said first cam means



has crossed said apex and said actuator block has not pivoted, whereby to positively force said actuator block to pivot in response to pivoting of said toggle lever; and

contact means actuated by said actuator block;

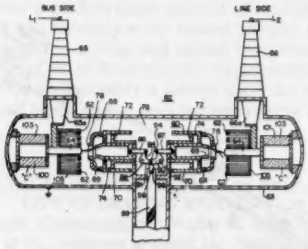
wherein said second cam means forces said actuator block to pivot counterclockwise when said first cam means has rightwardly crossed said apex and said actuator block has not pivoted.

4,103,128

TANK-TYPE COMPRESSED-GAS CIRCUIT-BREAKER HAVING CAPACITANCE-SUPPORTING MEANS

Itai Kosaku, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,796
Claims priority, application Japan, Jun. 13, 1974, 49-67750
Int. Cl.[2] H01H *33/16*
U.S. Cl. 200—144 AP **6 Claims**

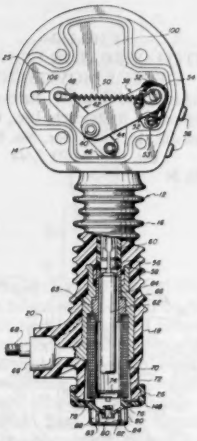


1. A tank-type compressed-gas circuit-breaker including a grounded metallic tank structure, a terminal-bushing extending into said tank structure and supporting a relatively-stationary contact structure adjacent its interior end, a movable contact structure movable relative to said stationary contact structure and cooperable therewith to establish an arc, and capacitance-supporting means disposed within said tank structure and adjacent one interior end of the tank structure to assist the terminal-bushing in supporting the relatively-stationary contact structure against the impact forces involved during the closing operation of the circuit-breaker and also providing a desirable line-to-ground capacitance for the circuit-breaker itself.

4,103,129
HIGH VOLTAGE CIRCUIT INTERRUPTER SWITCH ARRANGEMENT

David M. Evans, Palatine, and Joel A. Ramos, Chicago, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 9, 1977, Ser. No. 775,904
Int. Cl.[2] H01H 33/02
U.S. Cl. 200—144 R 15 Claims



1. In a high voltage circuit interrupter arrangement for interrupting current flow in an electrical circuit including an integrally-formed hollow unitary housing formed of an insulating material, the housing including an operating mechanism enclosing portion having a hollow interior, and an interrupter portion having a hollow interior, the hollow interiors communicating with one another, a stationary contact mounted within the hollow interior of said interrupter portion, a movable contact normally engaging the stationary contact, an improvement comprising:

a cover for closing an access opening in a side wall of the operating mechanism-enclosing portion of the housing, said cover having a circular opening formed therethrough and a groove formed in an interior surface of said cover;

a groove formed on an interior surface of the operating mechanism enclosing portion of the housing opposite said groove in said cover when said cover is in place over said access opening in the housing;

a circular opening through a side wall of the operating mechanism enclosing portion of the housing opposite said circular opening in said cover when said cover is in place over said access opening;

a shaft, said shaft positioned so that one end thereof is located in said circular opening in said cover, and the other end is located in said circular opening in the housing;

at least one trigger member, said at least one trigger member being attached to an end of said shaft so that when said trigger member is pivoted, said shaft rotates;

a first lever arm assembly locked at one end thereof to said shaft;

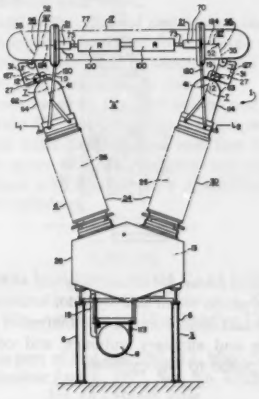
a second lever arm assembly pivotably connected to the other end of said first lever arm assembly intermediate the ends of said second lever assembly; said second lever arm assembly being pivotably connected at one end to the movable contact;

a guide pin attached to the other end of said second lever arm assembly said guide pin dimensioned to engage and slidably ride in said grooves in said housing and said cover, whereby motion of the other end of said second lever is defined by said grooves in said housing and said cover.

4,103,130
RESISTOR APPLICATIONS FOR HIGH-POWER CIRCUIT BREAKERS

Winthrop M. Leeds, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1975, Ser. No. 544,992
Int. Cl.[2] H01H 33/70
U.S. Cl. 200—148 A 21 Claims



1. A dual-pressure gas-blast type of high-power circuit-interrupter including a main-power high-voltage interrupter assemblage having a pair of separable power contacts, a high-voltage piston operator (10) for effecting opening and closing movements of said separable power contacts, an electrically-shunting puffer-type resistance interrupting unit disposed at high-voltage and electrically shunting said main-power interrupting assemblage, said shunting puffer-type resistor unit at high voltage including a pair of separable resistor contacts and an electrically serially-related resistance element, and direct connecting linkage means directly connected to said high-voltage piston operator (10) for causing the opening of the separable resistance contacts following the prior separation of the main power-interrupting contacts in the main-power interrupting assemblage.

4,103,131
PUFFER INTERRUPTER WITH MAIN AND AUXILIARY PISTONS AND COMMON CYLINDER

Rudolf Graf, Oberentfelden; Ernst Lang, Schlossrued; Viktor Stephanides, Zurich; Richard Thaler, Unterentfelden, and Hans-Rudolf Wüethrich, Oberentfelden, all of Switzerland, assignors to Sprecher & Schuh Ltd. (SSA), Aarau, Switzerland

Filed Sep. 20, 1976, Ser. No. 724,617
Claims priority, application Switzerland, Sep. 26, 1975, 12542/75
Int. Cl.[2] H01H 33/88
U.S. Cl. 200—148 A 7 Claims

1. A puffer-type circuit interrupter comprising, in combination:

a main stationary piston member supported on an elongated stationary support rod,

an auxiliary piston mounted concentrically with said main piston and slidably mounted on said support rod,

an axially movable cylinder slidably receiving both said main and auxiliary pistons and relatively movable with respect thereto,

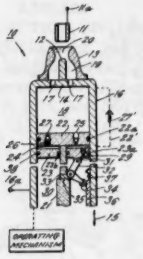
a main pressure volume disposed between said main piston and one end of said cylinder,

an auxiliary pressure volume disposed between said main and auxiliary pistons,

contact means and nozzle means disposed at said one end of said cylinder and channel means communicating between

said main pressure volume and said nozzle means and said contact means to produce a gas blast past said contact means when said cylinder moves to compress said main volume,

pressure-limiting valve means connected between said main and auxiliary pressure volumes to maintain no greater than a given pressure differential between said volumes,



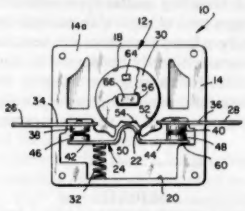
and connection means for connecting said auxiliary piston to said main piston when said cylinder is initially moved to compress said main volume, and thereafter disconnecting said main and auxiliary volumes, and connecting said auxiliary piston to said cylinder.

4,103,132

ROTARY SWITCH

Daniel Schwarzkopf, Hamden, Conn., assignor to Unimax Switch Corporation, Wallingford, Conn.

Filed Oct. 5, 1976, Ser. No. 729,662
Int. Cl.[2] H01H *3/42, 19/62*
U.S. Cl. 200—153 LB **18 Claims**



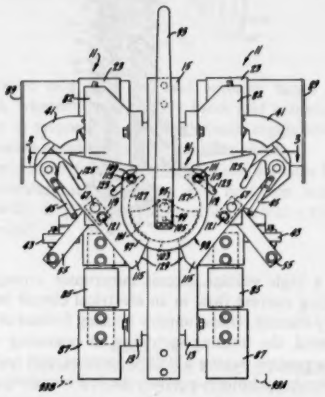
1. An electrical switch comprising a housing member of electrically insulating material having an interior cavity bounded by a guide wall surface of circular configuration, said guide wall surface having an opening therein, a cam member of electrically insulating material comprising a disc having a generally circular peripheral camming surface with a dwell portion, the circular peripheral surface of said cam member being of slightly smaller size than said cavity, and being closely received and rotatably mounted in said cavity with said guide wall surface serving as the bearing surface for said cam member, a fixed contact within the interior of said housing member, switch contact means including a movable contact mounted in said housing member adjacent said fixed contact for movement between a switch-closed operating position in engagement with said fixed contact and a switch-open-operating position out of engagement with said fixed contact, said switch contact means having a portion thereof extending through the opening in said guide wall surface into engagement with said cam member, means for rotating said cam member within said cavity between a first position in which said switch contact means engages the circular peripheral surface of said cam member to provide one of said operating positions, and a second position in which said switch contact means engages the dwell portion of said cam member to provide the other of said operating positions.

4,103,133

DUAL SWITCH OPERATOR USING MODIFIED GENEVA MOVEMENT

John Walter Erickson, and John W. Erickson, both of Crystal Lake, Ill., assignors to Boltswitch, Inc., Crystal Lake, Ill.

Filed Jul. 14, 1977, Ser. No. 815,543
Int. Cl.[2] B65D *3/44*
U.S. Cl. 200—153 N **12 Claims**



1. A dual switch actuator mechanism for coordinated actuation of two high-current switches, each switch including a switch operator mechanism for opening and closing the switch in response to rotation of a switch operator shaft in opposed directions, the switches being mounted adjacent each other with the switch operator shafts in aligned paraxial spaced relation to each other, the dual switch actuator mechanism comprising:

a rotatable main shaft, positioned between and in aligned paraxial relation to the two switch operator shafts;

a Geneva drive plate affixed to the main shaft for rotation therewith and having an arcuate bearing surface;

a pair of drive pins mounted in spaced relation to each other on the drive plate;

two modified Geneva follower plates, each affixed to the switch operator shaft of a respective switch operator mechanism, each follower plate having a drive slot for receiving one of the drive pins and each follower plate further having an arcuate bearing surface complementary to the drive plate bearing surface;

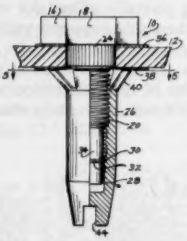
the follower plates being aligned, relative to the main shaft and drive plate, so that for a given neutral position of the main shaft, each drive pin is positioned in the entrance of a follower plate drive slot and the bearing surfaces of both follower plates engage the drive plate bearing surface,

rotation of the main shaft through a predetermined arc in either direction from the neutral position causing one guide pin to move inwardly of the drive slot of one follower plate to rotate that follower plate and its associated switch operator shaft and thereby actuate one of the switches between open and closed conditions without actuation of the other switch.

4,103,134
SWITCH ASSEMBLY FOR CONNECTING OPPOSING CIRCUITS ON A PRINTED CIRCUIT BOARD

Peter P. Urgero, 542 Hickok, Park Forest South, Ill. 60466

Filed Oct. 7, 1976, Ser. No. 730,578
Int. Cl.[2] H01B 3/40
U.S. Cl. 200—158 7 Claims

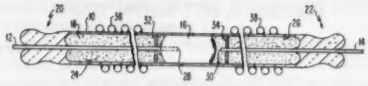


1. Apparatus for connecting an electrical circuit on one side of a dielectric circuit board with a circuit on the opposite side of the circuit board comprising a switch assembly received in an opening in the circuit board and having a threaded electrically conductive male member provided with a flat head, an electrically conductive female member internally threaded for reception of said male member, said female member being provided with at least one radially angularly extending contact, said female member being rotatable with respect to said male member to effect energization of the circuit on said other side of said board.

4,103,135
GAS OPERATED SWITCHES

Richard Santiago Gomez, Jericho, and Eugene James Scray, Jr., Burlington, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 1, 1976, Ser. No. 701,936
Int. Cl.[2] H01H 29/00
U.S. Cl. 200—185 24 Claims



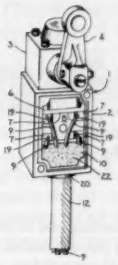
1. A switch comprising
a capillary tube having first and second ends and a substantially uniform internal diameter between said ends, said ends being closed to form a hermetically sealed chamber within said tube,
a non-oxidizing gas disposed within said chamber,
a pair of electrical conductors, each having a contact point disposed within said chamber,
a globule of conductive liquid disposed within said chamber so as to form first and second compartments containing said gas,
first and second barrier members disposed within said first and second compartments, respectively, in the vicinity of said globule of conductive liquid so as to confine said globule within a predetermined volume, and
means disposed between said first and second ends of said capillary tube for heating said gas in said first and second compartments to position at selected intervals said globule of liquid in contact with the contact points of said pair of conductors simultaneously.

18. A switch comprising:
a unitary capillary tube having first and second closed ends and made of electrically non-conducting material forming an elongated chamber, said tube having a substantially uniform cross-section along the axis of said tube between said ends,
first and second conductive members each having one end disposed within said chamber,
first, second and third fluids disposed within said chamber, said first fluid being conductive and at least one of said second and third fluids being insulative, said first fluid being disposed further so as to isolate said second and third fluids from each other,
means disposed within each of said second and third fluids for preventing said first fluid from passing therethrough while permitting said fluid in which each of said means is disposed to pass therethrough, and
means disposed between the first and second ends of said capillary tube for controlling the pressure exerted by said second and third fluids against said first fluid so as to selectively move said first fluid into and out of simultaneous contact with said one ends of said first and second conductive members.

4,103,136
SWITCH HOUSING WITH CABLE SEAL

Thomas G. Karakis, Greendale, and Clayton J. Klotz, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 797,612, May 17, 1977. This application Aug. 4, 1977, Ser. No. 821,881
Int. Cl.[2] H01H 9/04
U.S. Cl. 200—302 10 Claims



1. A prewired electrical switch including a housing providing a cable seal, said housing having an electrical cable receiving section which includes a plurality of conductor receiving pockets, at least one of said pockets containing a folded portion of an individual electrical conductor, said folded portion including both insulated and uninsulated sections of said conductor, said pocket further containing a non-conductive potting compound which forms fluid-tight seals with the portions of the conductor within the pocket thereby preventing fluid from the outside from traveling along the conductor into the switch.

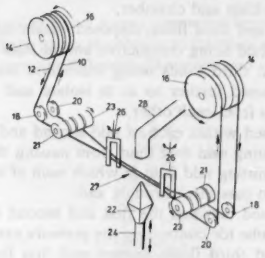
4,103,137
CUTTING OF MATERIALS BY SPARK EROSION

Charlie Maurice Levitt, 208 Sunvalley Lodge, Johannesburg; Samuel Chatterley, 1 Riethaan St., Florida Lake, and Peter John Livsey Flinn, 115, St. Audley Rd., Transvaal, all of South Africa

Filed Aug. 30, 1976, Ser. No. 718,472
Claims priority, application South Africa, Sep. 4, 1975, 75/5666; Mar. 22, 1976, 76/1744
Int. Cl.[2] B23P 1/08
U.S. Cl. 219—69 W 19 Claims

1. A method of cutting a material in a given direction of cut utilizing a pair of spaced electrodes presenting generally parallel, elongate and spaced edges, including the steps of
placing the electrode edges adjacent the material,

applying a voltage across the electrodes to produce a spark between the edges, and



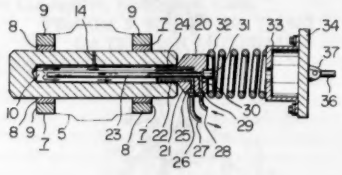
effecting relative movement between the edges and the material in the direction of cut to effect cutting.

4,103,138

APPARATUS FOR BUILD-UP WELDING WITH COOLING OF A SEALED AND LUBRICATED TRACK LINK

Y. Moriki, Tokyo, Japan, assignor to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,869
Claims priority, application Japan, Mar. 25, 1975, 50-34940
Int. Cl.[2] B23K *9/04*
U.S. Cl. 219—76.11 **14 Claims**



1. An apparatus for feeding and draining coolant through the interior of a connecting pin of a sealed and lubricated track link assembly, during a build-up welding operation thereon, comprising:

an adapter having first fluid passage means therein for introducing said coolant into said connecting pin interior and second fluid passage means disposed between said connecting pin interior and said first fluid passage means and extending parallel to said first fluid passage means for directly discharging said coolant from said first fluid passage means and from said connecting pin interior;

means for resiliently biasing said adapter toward said connecting pin in water tight contact with said connecting pin; and

means for performing said build-up welding operation associated with said connecting pin.

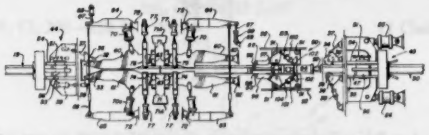
4,103,139

WELDING APPARATUS

Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Switzerland

Division of Ser. No. 514,396, Oct. 15, 1974, Pat. No. 3,982,091.
This application May 12, 1976, Ser. No. 685,681
Int. Cl.[2] B23K *11/02*
U.S. Cl. 219—101 **6 Claims**

1. Welding apparatus for welding rail sections together in end to end relationship to form a continuous rail comprising, in combination: a pair of vertical clamping assemblies for vertically clamping and aligning the respective ones of a pair of rail sections to be welded together to form a continuous rail, said vertical clamping assemblies including electrodes engageable with adjacent ends of a pair of rail sections to be welded together; means for causing current flow between said electrodes and through the ends of said rail sections in order to make a weld; a pair of horizontal clamping assemblies for horizontally clamping and aligning the respective ones of said pair of rail sections; said pair of vertical clamping assemblies each comprising a pair of upper and a pair of lower level arms, the lever arms of each pair being spaced on opposite sides of a rail section and being pivotally affixed for rotation in a vertical plane at one end thereof, the opposite ends of the lever arms of each pair having one of said electrodes connected between them so that each of said electrodes engages one of the upper and lower surfaces of said rail section when the respective pairs of said lever arms are pivotally rotated, said upper and



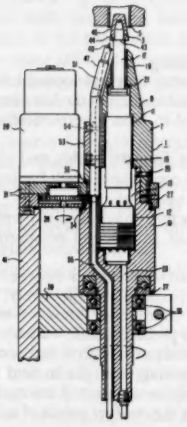
lower pairs of lever arms being rigid in the vertical plane thereof and being flexible within limits in a horizontal plane, whereby no undue stress is placed on said lever arms during horizontal alignment of said rail sections, and means for pivotally rotating the respective pairs of lever arms to engage said electrodes with said rail section to vertically clamp said rail section between them; said means for causing current flow between said electrodes comprising rectifier means and three monophase transformers having separate cores and two secondary windings coupled with said rectifier means to provide a six-phase rectifying of the welding current, whereby the welding current never goes to zero and voltage peaks induced by large current fluctuations are avoided, thereby providing a smoother flash operation in forming a weld.

4,103,140

PNEUMATIC HAMMER AND WELDER

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,675
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—125.11 **10 Claims**



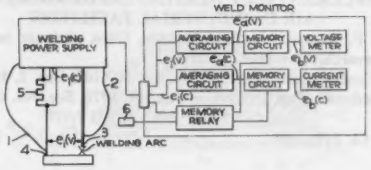
1. Apparatus for driving a tapered plug into a tube and forming a seal weld therebetween, said apparatus comprising a spindle having a axially located cavity, a pneumatic hammer

disposed in said cavity, a chisel adapted to receive said tapered plug, said chisel extending through a portion of said spindle and being received by said pneumatic hammer, a welding torch eccentrically disposed on said spindle, and means for rotating said spindle, whereby said apparatus can drive the tapered plug into the tube and form a peripheral seal weld at the outer juncture of the plug and tube in serial operations.

4,103,141
WELD MONITOR

Cecil C. Wristen, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 643,319, Dec. 22, 1975, abandoned. This application May 23, 1977, Ser. No. 799,386
Int. Cl.² B23K 9/10
U.S. Cl. 219—130.01 **1 Claim**



1. A weld monitor for utilization with a welding apparatus having an arc torch and provided with a meter having a current indicating section including a dial and a voltage indicating section including a dial to permit an operator to check the output of the welding apparatus by himself;

a power supply for the welding apparatus;

a voltage averaging circuit electrically connected to receive an instantaneous arc voltage from the power supply as supplied to the arc torch, said voltage averaging circuit being operable to integrate the instantaneous arc voltage and provide an average voltage signal;

circuit means electrically connecting said voltage averaging circuit to the voltage indicating section of said meter;

a current averaging circuit electrically connected to receive an instantaneous arc current signal, said instantaneous arc current being obtained from a shunt connected across the torch, said current averging circuit being operable to integrate the instantaneous arc current and provide an average current signal;

circuit means electrically connecting said current averaging circuit to the current indicating section of the meter;

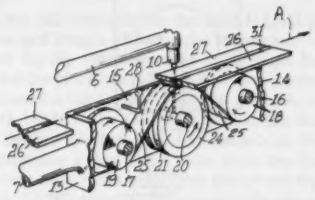
an average arc current memory circuit and an average arc voltage memory circuit electrically connected to receive the average arc current signals and average voltage signals from their respective averaging circuits, said memory circuits being identical and each comprising a capacitor electrically connected to receive the average signal, a field effect transistor interposed between the capacitor and the average signal input thereto, said transistor serving as a switch to connect and disconnect the capacitor from the averaging circuit; a measurement circuit including an operational amplifier electrically connected to permit the charge on said capacitor to be measured without the capacitor being discharged; and

switch means to activate said memory circuits including a relay having a normally closed contact in circuit with said field-effect transistor; said relay when energized by the closing of said switch operating to open its normally closed contact to thereby interrupt the reactive bias voltage on the field-effect transistor so that the field-effect transistor switches to an open state, said capacitor in said memory circuit remaining charged at the voltage which existed at the moment that the field effect transistor of said memory circuit was switched to an open state and said operational amplifier provides a voltage output which is equal to the voltage on the capacitor, and a feed back loop in the memory circuit operable to cause the amplifier to have a high input impedance so that voltage on the capcitor is not discharged when the amplifier is measuring the voltage on the capacitor to thereby maintain the memory.

4,103,142
APPARATUS AND METHOD FOR USE IN ONE-SIDED WELDING

Frederick D. Cartwright, 506 Lake Club Apts., Lake Rd., Germiston, 1401, South Africa

Filed Mar. 17, 1975, Ser. No. 559,367
Claims priority, application South Africa, Mar. 28, 1974, 74/0803; May 9, 1974, 74/2953; Aug. 9, 1974, 74/5099; Aug. 23, 1974, 74/5410
Int. Cl.² B23K 9/02
U.S. Cl. 219—136 **5 Claims**



1. Apparatus for positioning a flexible backing strip in one-sided welding together of workpieces along a weld line comprising:

(a) an elongated strip of flexible disposable backing material;

(b) first means from which the strip is passed to the workpieces;

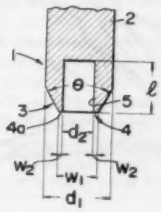
(c) second means to which the strip passes from the workpieces; and

(d) means positioned between said first and said second means for holding the strip to underlie the weld line and against the workpieces, said means comprising circular roller means having round, concentric, resilient outer means for pressing against the side of the strip opposite the weld line to form a landing which bears against the strip.

4,103,143
ELECTRODES FOR TUNGSTEN INERT GAS WELDING

Nobuyuki Yamauchi, and Takao Taka, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed May 24, 1977, Ser. No. 800,010
Claims priority, application Japan, May 28, 1976, 51-62547
Int. Cl.² B23K 35/00
U.S. Cl. 219—145.21 **7 Claims**



1. Tungsten electrode for TIG welding comprising a body of substantially circular cross-section having a diameter not less than 3 mm, said body having a tip end formed in a frustoconical shape having a cone angle less than 120° and having an axial recess of substantially circular cross-section having a depth not less than 2 mm, said recess being substantially co-axial with the

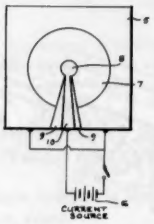
the body to leave an annular tip area having a radial width not greater than 3 mm.

4,103,144

LOW INDUCTANCE HEATER CONFIGURATION FOR SOLID STATE DEVICES AND MICROCIRCUIT SUBSTRATES

Frank A. Pizzarello, Yorba Linda, and Theodore J. LaChapelle, Jr., Orange, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,471
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—209 **4 Claims**



1. A solid state device heater comprising

a ceramic substrate sheet member having one plane surface adapted to permit eutective bonding of a photodetector device thereto and a resistance heater element deposited on the opposite plane surface thereof, said heater element comprising a disc of electrically conductive material, an annular region of resistive material encompassing and in electrical contact with said disc, and a peripheral region of electrically conductive material encompassing and in electrical contact with said region of resistive material,

a source of electrical current. and

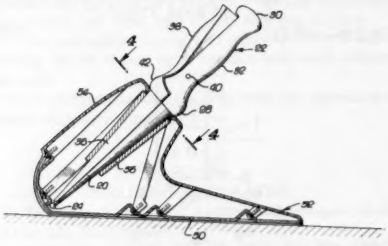
means connecting said source of electrical current between said disc and said peripheral region of electrically conductive material.

4,103,145

HAIR CURLING IRON AND OVEN

Joseph T. Oliveri, 6520 Palos Verdes Dr., East, Rancho Palos Verdes, Calif. 90274

Filed Jul. 24, 1975, Ser. No. 598,800
Int. Cl.[2] H05B *1/00*; A45D *1/20, 4/12*
U.S. Cl. 219—222 **11 Claims**



1. A hair styling iron comprising in combination:

a curling iron including a heat conductive cone mounted at a first junction to an insulated handle, and tapered from a first large diameter rear portion adjacent said handle to a second smaller diameter front portion;

a stop member on the forward end of the cone including hair positioning means diametrically larger than and extending outwardly from said smaller diameter front portion for preventing small diameter curls from slipping off the cone during the curling process;

a clamp including a heat conductive forward end shaped to fit against the outside of said cone, and connected through a second junction to a rear insulated actuating arm; and

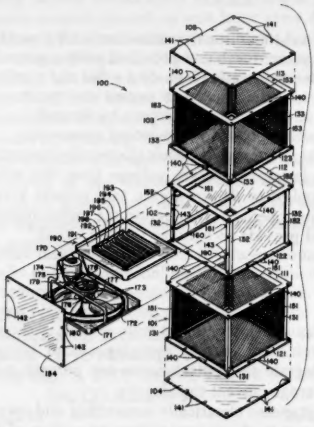
attachment means coupled between said curling iron and said clamp for movably connecting said clamp to said curling iron such that manual manipulation of said arm moves said forward end of said clamp between a closed position against said cone to an open position displaced from said cone to position the hair rearwardly of said stop member and between said clamp and said cone.

4,103,146

METHODS AND APPARATUS FOR DUCTLESSLY CIRCULATING AND SELECTIVELY SUPPLEMENTALLY HEATING LARGE VOLUMES OF AIR IN INDUSTRIAL FACILITIES

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Continuation-in-part of Ser. No. 609,142, Sep. 2, 1975, abandoned. This application Jan. 19, 1976, Ser. No. 649,983
Int. Cl.[2] F24H *3/02*; H05B *1/00*
U.S. Cl. 219—368 **3 Claims**



1. An apparatus positionable at a central location within a heated industrial building and the like to promote improved circulation of heated air within the walls of the building and thereby improve the efficiency of operation of existing heater units, comprising:

(a) an upstanding structure of substantially right parallelepiped configuration including an assembly of lower and upper modules with at least one intermediate module arranged one atop the other and releasably secured together to define a vertical chamber extending through the assembled modules;

(b) each of said lower and upper modules having planar, multi-perforated perimetral faces over substantially the entire lateral surface area thereof to define air inlets and air outlets, respectively, for said apparatus;

(c) said air inlets and said air outlets each being of a height of from about 2 to 3 feet to draw in and discharge air in stratified layers and at a velocity sufficient to establish a generally toroidal flow of air toward the walls of said building;

(d) said toroidal flow being sufficient to establish a counter toroidal flow in the air above said apparatus so as to recirculate heated air which accumulates adjacent the ceiling of said building;

(e) each of said at least one intermediate module having

sidewalls imperforate to air to inhibit the passage of air therethrough;

(f) a blower assembly housed entirely within said at least one intermediate module and including a fan for drawing ambient air through said air inlet, ducting said air upwardly through the chamber and discharging said air through said air outlet at a velocity sufficient to establish a toroidal flow toward the walls of said building;

(g) and said upper and lower modules being devoid of any encumbrance to air flow therethrough.

4,103,147

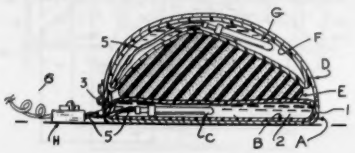
DEVICE FOR HEATING A BREAST PROSTHESIS

Birttie L. Carvalho, 15200 Wiley St., San Leandro, Calif. 94579

Filed Nov. 26, 1976, Ser. No. 745,043

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—524 **1 Claim**



1. A breast prosthesis heater comprising:

(a) a base;

(b) a first flexible waterproof thermally conductive and electrically non-conductive material sealed and liquid containing bag supported by said base and adapted to support a breast prosthesis, the upper surface of said bag conforming to the under surface of the prosthesis so as to have uniform contact therewith;

(c) a dome-shaped cover for said base and being hingedly connected thereto;

(d) a second flexible, waterproof, thermally conductive and electrically non-conductive material, sealed and liquid containing bag secured to the inner surface of said dome-shaped cover, the undersurface of said second bag conforming to the irregular upper surface of the prosthesis when the prosthesis rests on said first bag and said cover is in closed position; whereby substantially the entire exterior surface of the prosthesis is uniformly contacted by both bags;

(e) an electric heating element submerged in the liquid in each bag for heating said liquids; and

(f) an electric insulated cord interconnecting said heating elements with an electric outlet and having temperature control means for controlling the heat delivered by said heating elements to maintain the breast prosthesis at the temperature of the human body.

4,103,148

DYNAMIC PULSE DIFFERENCE CIRCUIT

Gerald L. Erickson, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,500

Int. Cl.[2] G06M *3/14*; G01T *1/00*

U.S. Cl. 235—92 PC **1 Claim**

1. A digital electronic circuit for producing pulses proportional to a continuously running net count of the difference between gamma pulses and a background of gamma pulses, the circuit comprising:

a first terminal (**10**) receiving the input signal pulse;

a second terminal (**12**) receiving the proportional background pulse;

a first NAND gate (**18**) connected to the first terminal (**10**) to invert the total count;

a second NAND gate (**26**) connected to the second terminal (**12**) to invert the background count;

a third NAND gate (**34**) connected to the first and second NAND gates (**18** and **26**) to receive outputs therefrom;

a first flip-flop (**44**) connected to the third NAND gate (**34**) to receive therefrom a clock pulse and triggering pulses and to generate therefrom a first count pulse and a second count pulse;

a fourth NAND gate (**20**) connected to the first terminal (**10**) and the first flip-flop (**44**) and receiving the first count pulse therefrom;

a fifth NAND gate (**28**) connected to the second terminal (**12**) and the first flip-flop (**44**) and receiving the second count pulse therefrom;

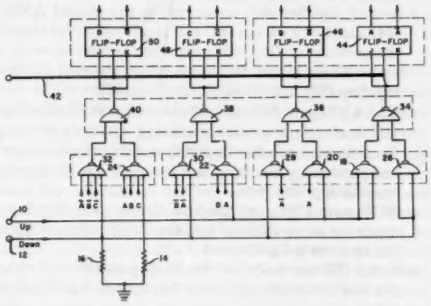
a sixth NAND gate (**36**) connected to the fourth and fifth NAND gates (**20** and **28**) and responsive to outputs therefrom;

a clock bus (**42**) connected to the third NAND gate (**34**) to receive and couple a clock pulse therefrom;

a second flip-fllp (**46**) connected to the sixth NAND gate (**36**) and the clock bus (**42**) and receiving inputs therefrom to generate a third count pulse and a fourth count pulse;

a seventh NAND gate (**22**) connected to the first terminal (**10**), the first flip-flop (**44**), and the second flip-flop (**46**) and receiving a first count pulse from the first flip-flop (**44**) and a third count pulse from the second flip-flop (**46**);

an eighth NAND gate (**30**) connected to the second terminal



(**12**), the first flip-flop (**44**), and the second flip-flop (**46**) and receiving a second count pulse from the first flip-flop (**44**) and a fourth count pulse from the second flip-flop **46**;

a ninth NAND gate (**38**) connected to the seventh and eighth NAND gates (**22** and **30**) and responsive to outputs therefrom;

a third flip-flop (**48**) connected to the ninth NANd gate (**38**) and the clock bus (**42**) and receiving inputs therefrom to generate a fifth count pulse and a sixth count pulse;

a tenth NAND gate (**24**) connected to the first terminal (**10**), the first, second, and third flip-flops (**44**, **46**, and **48**) and receiving a first count pulse from the first flip-flop (**44**), a third count pulse from the second flip-flop (**46**), and a fifth count pulse from the third flip-flop (**48**);

an eleventh NAND gate (**32**) connected to the second terminal (**12**) and to the first, second, and third flip-flops (**44**, **46**, and **48**) and receiving a second count pulse from the first flip-flop (**44**), a fourth count pulse from the second flip-flop (**46**) and a sixth count pulse from the third flip-flop (**48**);

a twelfth NAND gate (**40**) connected to the tenth and eleventh NAND gates (**24** and **32**) to receive an input therefrom;

a fourth flip-flop (**50**) connected to the twelfth NAND gate (**40**) and the clock bus (**42**) and receiving inputs therefrom to generate a seventh count pulse and an eighth count pulse;

a thirteenth NAND gate (**52**) connected to the first, second,

third, and fourth flip-flops (44, 46, 48 and 50) and receiving a first count pulse from the first flip-flop (44), a fourth count pulse from the second flip-flop (46), a sixth count pulse from the third flip-flop (48), and an eighth count pulse from the fourth flip-flop (50);

a fifth flip-flop (58) connected to the thirteenth NAND gate (52), the clock bus (42) and to an electrical ground and generating an output;

a fourteenth NAND gate (54) connected to the first, second, third, and fourth flip-flops (44, 46, 48, and 50) and receiving a first count pulse from the first flip-flop (44), a third count pulse from the second flip-flop (46), a sixth count pulse from the third flip-flop (48), and an eighth count pulse from the fourth flip-flop (50);

a first AND gate (62) connected to the fourteenth NAND gate (54) and the fifth flip-flop (58) and receiving inputs therefrom;

a sixth flip-flop (60) connected to the first AND gate (62), the thirteenth NAND gate (52), and the clock bus (42), receiving inputs therefrom, and generating an output in response to the inputs;

a fifteenth NAND gate (56) connected to the first, second, third, and fourth flip-flops (44, 46, 48, and 50) and receiving a first count pulse from the first flip-flop (44), a third count pulse from the second flip-flop (46), a fifth count pulse from the third flip-flop (48), and a seventh count pulse from the fourth flip-flop (50);

a second AND gate (64) connected to the fifteenth NAND gate (56) and the sixth flip-flop (60) and receiving inputs therefrom;

a seventh flip-flop (66) connected to the second AND gate (64) and the clock bus (42) and receiving inputs therefrom, the seventh flip-flop (66) generating as outputs an up pulse and a down pulse, the down pulse coupled to the fifth flip-flop (58) and the sixth flip-flop (60);

a third AND gate (68) connected to the seventh flip-flop (66) and to electrical ground, receiving as inputs the up pulse from the seventh flip-flop (66) and the electrical ground, and producing an output that is supplied as an input to the seventh flip-flop (66);

a NOR gate (70) connected to the seventh flip-flop (66), receiving as input therefrom the down pulse, and producing an inverted pulse; and

a binary (72) connected to the NOR gate (70) and receiving the inverted pulse therefrom to produce a positive output pulse,

which pulse is proportional to a continuously running net count of the difference between the input count and the background count.

4,103,149

ARRANGEMENT FOR THE PERFORMING SEIZURE STATISTICS FOR A DEVICE BELONGING TO A GROUP OF DEVICES

Lars Kalle Lindén, Hästveda, and Kjell Stellan Persson, Skärholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

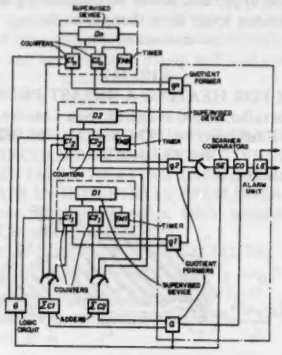
Filed Mar. 28, 1977, Ser. No. 782,063

Claims priority, application Sweden, Apr. 13, 1976, 7604340

Int. Cl.[2] G07C *3/10;* **H04M** *15/18*

U.S. Cl. 235—92 TE **1 Claim**

1. Arrangement for the statistical supervision of a number of devices belonging to a group of devices in a telecommunication system with respect to seizure conditions, i.e. the ratio between the number of normal seizures and the total number of seizures, which devices being alternately seized and released, said arrangement comprising two counters associated with each individual device, a first counter for counting the total number of seizures of the device, a second counter for counting the number of seizures exceeding a certain minimum time, means associated with each individual device for measuring said minimum time, dividing means connected to outputs of said counter for the periodic calculation of the ratio between the numbers accumulated by said second and said first counter, first adding means for adding of the numbers obtained from all said first counter belonging to the group of devices, second adding means for adding of the values obtained from all said second counters belonging to the group of devices, dividing means connected to outputs of said adding means for periodically calculating the quotient between the sums obtained from said second counters and said first counters, a gate circuit means for the periodical transfer of the quotient belonging to



an individual device as well as the quotient belonging to the whole group of devices a comparison means connected to said gate circuit means, said comparison means including means for comparing the quotient between the number of seizures exceeding a certain time and the total number of seizures for each individual device with the corresponding quotient for the whole group of devices, and alarm means connected to said comparison means for producing alarm signals for certain differences between the values of said quotients.

4,103,150

ARRANGEMENT FOR CONTROLLING THE ACCESS TO AN ESTABLISHMENT AND ENTRY CARD SUITABLE FOR SUCH AN ARRANGEMENT

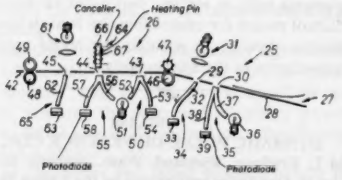
Fritz von Ballmoos, Horgen, Switzerland, assignor to Guhl & Scheibler AG, Aesch, Switzerland, a part interest

Filed Mar. 5, 1976, Ser. No. 664,312

Claims priority, application Switzerland, Mar. 10, 1975, 2987/75; Feb. 19, 1976, 2017/76

Int. Cl.[2] G06K *5/00, 7/14, 19/06*

U.S. Cl. 235—419 **19 Claims**



1. An access control system for selectively controlling entry to an establishment comprising an entry card and a device for scanning said entry card and determining access to the establishment, said entry card including at least a first region having machine-readable information applied prior to issue of the card and a second region having at least one cancellable value field, said field intended to be cancelled before releasing entry to the establishment, a canceller for cancelling said field, said device including at least a first reader provided for the reading of said information, and a second reader for reading the condition of said value field, and means responsive to the read information and the read condition for determination of the validity of the

card, for activating said canceller and for releasing entry to the establishment if said information coincides with a predetermined comparison value, said validity determination indicating at least one non-cancelled value field and said canceller functioning to cancel said non-cancelled value field.

4,103,151

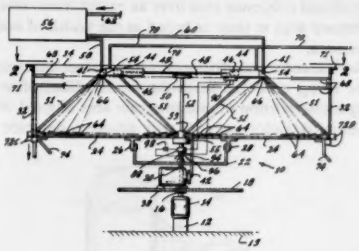
SOLAR TRACKING SYSTEM

Edsel Chromie, 6720 Belle Glade, San Diego, Calif. 92119

Division of Ser. No. 735,593, Oct. 26, 1976. This application Jul. 5, 1977, Ser. No. 812,526

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—203 R **2 Claims**



1. A system for tracking the relative movement of the sun and earth comprising:

a base member;

a positionable platform carried by said base member;

a plurality of light sensors, each light sensor providing a control signal when exposed to the direct rays of the sun, said sensors being positioned in a spaced apart relationship about the periphery of said positionable platform providing a first and second pair of diagonally opposed light sensors;

shielding means positioned adjacent each of said plurality of light sensors for preventing the direct rays of the sun from striking more than one light sensor of each pair of light sensors at any given time;

a first positioning means responsive to said control signals from said first pair of light sensors for providing directional rotation of said positionable platform with respect to said base member along a first path of travel between physical restraints; and

a second positioning means responsive to the control signals from said second pair of light sensors for providing directional rotation of said positionable platform with respect to said base member along a second path of travel between the physical restraints;

said first and second positioning means include control signal interruption means for stopping the movement of said positionable platform along said first and second paths of travel prior to reaching said physical restraints.

4,103,152

DISTANCE DETERMINING AND AUTOMATIC FOCUSING APPARATUS WITH FALSE PEAK DISCRIMINATION

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1976, Ser. No. 700,963

Int. Cl.[2] G01J *1/36*

U.S. Cl. 250—204 **5 Claims**

1. Apparatus for providing a measure of the distance between the apparatus and an object, comprising a plurality of radiation responsive elements in two image correlation arrays,

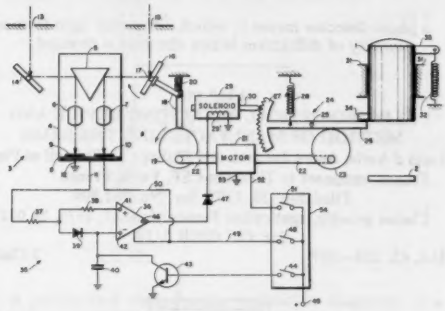
optical means for imaging said object on said image correlation arrays,

scanning means for relatively moving at least a portion of said optical means and said image correlation arrays through a range of relative positions during a scanning period,

signal processing means connected to said image correlation arrays to produce a correlation signal which peaks in a given direction at a one of said positions which is unique for the existing object distance, and which tends to peak in said direction to a lesser extent at others of said positions,

selective means connected to receive said correlation signal for producing a predetermined control effect upon the occurrence of each of said peaks in said period which is greater than all previous ones of said peaks occurring during said period, and

responsive means responsive to said control effect to effectively identify the one of said positions at which said



control effect is finally produced in said period as a measure of the existing object distance, said responsive means including first means coupled to said scanning means for providing a ramp signal of a value which changes in synchronism with said relative movement such that, at any time in said period, the value of said ramp signal represents the concurrent one of said relative positions, and second means connected to said first means to receive said ramp signal, and connected to said selective means to receive said control effect, for providing an output signal of a value which represents the value had by said ramp signal at the time of the latest production of said control effect in said period, the value of said output signal at the end of said period thus being a measure of the existing object distance.

4,103,153

DEVICE FOR MEASURING LIGHT INCIDENT ON AN IMAGE FORMING OPTICAL SYSTEM

Kazuya Matsumoto, Yokohama; Susumu Matsumura, Kawasaki; Aiichiro Koyama, Hokkaido; Youichi Okuno, Yokohama; Tokuichi Tsunekawa, Yokohama, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1976, Ser. No. 691,628

Claims priority, application Japan, Jun. 6, 1975, 50-68765; Jun. 6, 1975, 50-68766; Jun. 6, 1975, 50-68767; Jun. 6, 1975, 50-68768; Jun. 6, 1975, 50-68769; Jun. 6, 1975, 50-68770; Jun. 6, 1975, 50-68771; Jun. 6, 1975, 50-68772; Jun. 6, 1975, 50-68773; Jun. 6, 1975, 50-68774; Jun. 6, 1975, 50-68775; Jun. 6, 1975, 50-68776; Jun. 6, 1975, 50-68777; Jun. 6, 1975, 50-68778; Jun. 6, 1975, 50-68779; Jun. 6, 1975, 50-68780; Jun. 6, 1975, 50-68781; Jun. 6, 1975, 50-68782; Jun. 6, 1975, 50-68783

Int. Cl.[2] G02B *5/14*

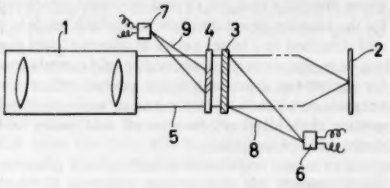
U.S. Cl. 250—227 **2 Claims**

1. A device for measuring light incident on an image forming optical system, comprising:

an image forming optical system for forming an image of an object on an image plane with which an optical path is formed;

a plurality of diffraction lattice elements arranged in the

optical path, each of which being carried by a transparent member, each having constant predetermined size and being substantially different from each other in area; and



a photo detector means to which diffraction light from said plurality of diffraction lattice elements is directed.

4,103,154

ELECTRO-OPTICAL BRANCHING DEVICE AND METHOD OF MANUFACTURING THE SAME

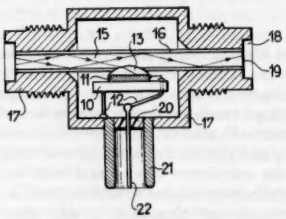
Luigi d'Auria; André Jacques, and Philippe Maillot, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 26, 1977, Ser. No. 762,509

Claims priority, application France, Jan. 27, 1976, 76 02191

Int. Cl.[2] G02B *5/14*

U.S. Cl. 250—227 **2 Claims**



1. An electro-optical branching device for picking up a fraction of optical radiation and converting the latter into an electrical signal, said device comprising a casing, a single optical fibre comprising an inner core and an outer cladding and having two ends, said outer cladding comprising a lateral opening, said casing surrounding said fibre and forming around said two ends mechanical connecting ferrules for connection to complementary ferrules, said device further comprising a photodetector element placed in said casing, said element having a sensitive area facing said opening and being fixed to said core through said opening by a sealing material to transmit said fraction of optical radiation; the refractive index of said sealing material being at least equal to that of said cladding.

4,103,155

POSITIONAL SENSOR-OPERATOR SYSTEM

Malcolm D. Clark, 4 St. Ronans Dr., Glascow G413 SJ, Scotland

Filed Oct. 14, 1976, Ser. No. 732,348

Claims priority, application United Kingdom, Oct. 16, 1975, 42406/75

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—231 SE **24 Claims**

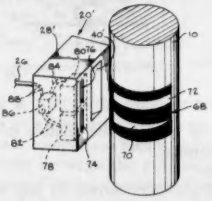
1. In combination with a rotary member, a positional sensor-operator system comprising:

a light reflective program area carried by said rotary member to rotate therewith, the length of said program area extending in a circumferential direction with respect to said rotary member and the width of said program area varying along the length of said program area as a function of lengthwise distance from one end of said program area so as to be indicative of the angular position of said rotary member and the light reflective characteristics being substantially uniform over said program area;

a reference area having light reflective characteristics substantially identical to those of said program area and carried by said rotary member to rotate therewith, the length of said reference area extending in a circumferential direction with respect to said rotary member and the width of said reference area being substantially uniform along its length;

means for projecting light onto at least a part of said program area over an extent transverse to said program area at least as broad as the maximum width of said program area and further operative to project light onto at least a part of said reference area over an extent transverse to said reference area at least as broad as the width of said reference area;

primary detector means operative to detect the amount of light being reflected from the entire width of a limited lengthwise portion of said program area aligned with said primary detector means, said primary detector means



being disposed opposite said program area whereby successive lengthwise portions of said program area will pass and primary detector means as said rotary member is rotated, said primary detector means further being operative to produce an output signal which is a function of the width of said program area;

auxiliary detector means disposed opposite said reference area and operative to detect the amount of light being reflected from a limited lengthwise portion of said reference area aligned with said auxiliary detector means, said auxiliary detector means further being operative to produce an output signal which is proportional to the amount of light being reflected from the aligned portion of said reference area;

means for producing a net output signal which is a function of the difference between the output signal of said primary detector means and the output signal of said auxiliary detector means;

and operator means operably connected to said means for producing said net output signal to receive said net output signal and produce a programmed response thereto.

4,103,156

LIGHT SCANNING DEVICE

Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama, and Yasushi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 746,832

Claims priority, application Japan, Dec. 12, 1975, 50-147862

Int. Cl.[2] H01J *3/14*

U.S. Cl. 250—236 **4 Claims**

1. A scanning device for reflecting a light beam, comprising:

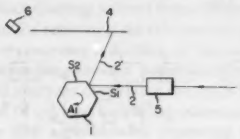
a. a light source for emitting a light beam;

b. a deflector having a reflecting surface which receives the light beam from said light source;

c. means to detect the incidence position of the light beam on the reflecting surface of said deflector; and

d. light intercepting means to interrupt the incidence of the

light beam on said reflecting surface in accordance with a detection signal from said detector means indicating that



the incidence position of said light beam has shifted to the corner of said reflecting surface.

4,103,157

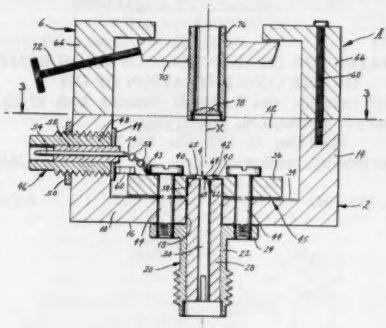
HIGH SPEED PHOTODETECTOR AND SYSTEM

Samuel I. Green, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 4, 1977, Ser. No. 765,728

Int. Cl.² H01J *5/02*

U.S. Cl. 250—239 **14 Claims**



1. A detector for sensing light pulses, said detector comprising: a metal base; a metal coverplate overlying the base and having a forwardly presented aperture therein; a dielectric material interposed between the coverplate and the base such that the dielectric material together with the base and coverplate form a parallel plate capacitor; a conductor extended through the base and into the coverplate and having its forward end at the aperture in the coverplate; a photosensitive diode in unpackaged chip form mounted on the forward end of the conductor and having a forwardly presented photosensitive surface which is exposed through the aperture, the diode further having first and second terminals with the first terminal being electrically connected directly to the conductor and the second terminal being electrically connected to the cover plate, a reversely biasing potential being applied to the diode across the parallel plate capacitor, whereby when a light beam illuminates the photosensitive surface of the diode, the diode will produce a signal in the form of an electrical current which may be analyzed with an oscilloscope connected to the conductor and base.

4,103,158

METHOD AND APPARATUS FOR GEOPHYSICAL PROSPECTING BY RADIOACTIVE DIAGRAPHY

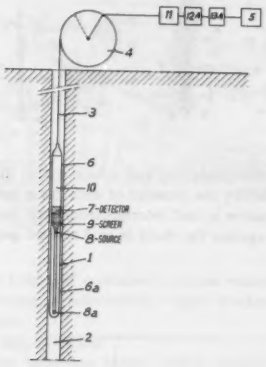
André J. Kermabon, Marseille, France, assignor to Syminex, Marseilles, France

Filed Oct. 15, 1976, Ser. No. 732,601

Claims priority, application France, Oct. 31, 1975, 75 34024

Int. Cl.² G01V *5/00*

U.S. Cl. 250—269 **9 Claims**



1. A prospecting method using radioactive diagraphy in a drill-hole comprising the steps of:

vertically displacing in the said drill-hole, at a slow speed, a probe including a radioactive source, at least one particle detector and one screen placed between said radioactive source and said detector;

periodically and rapidly displacing said source within the probe from a first position close to said at least one detector and at which the source bombards the terrain to be tested to a second position remote from said at least one detector;

periodically and rapidly displacing said at least one detector and the screen placed between said detector and the source, within the probe, in synchronism with the source from a first position adjacent the first position of said source to a second position corresponding substantially to the first position of said source, whereby when the source is in the second position remote from said at least one detector said at least one detector is surrounded by the terrain which has been bombarded by the source when the source was in its first position close to said detector;

and measuring with said detector, when the source is in said second position, the delayed radiation having a specific energy, which is emitted by the terrain surrounding the detector in its second position which was previously bombarded by the source.

4,103,159

RADIOGRAPHIC METHOD AND APPARATUS

Jürgen Orthmann, Grunwald, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,411

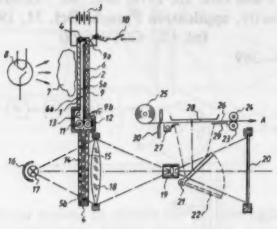
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610514

Int. Cl.² G03B *41/16*

U.S. Cl. 250—315 R **17 Claims**

1. A method of making X-rays images, comprising the steps of confining a high Z gas in the interelectrode gap of an ionography imaging chamber; introducing into the gap a dielectric receptor sheet having a film consisting of thermoplastic material; heating said film to the softening point of said material; exposing the thus softened film to object-modulated X-rays

whereby the film develops a relief image of the object; and rendering said relief image visible in accordance with the schlieren optical effect, including transferring the sheet from said interelectrode gap into a second gap which communicates



with said interelectrode gap and which is also filled with said high Z gas whereby the pressure of such gas in said second gap equals the pressure in said interelectrode gap, and directing a beam of light against the sheet in said second gap.

4,103,160

OPTICAL SCANNING EQUIPMENT

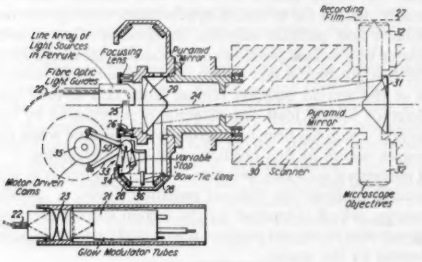
Colin Roy Moss, Dunstable, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Nov. 17, 1970, Ser. No. 97,401

Claims priority, application United Kingdom, Nov. 19, 1969, 46391/69

Int. Cl.[2] H01J *31/49*; G02B *13/08*

U.S. Cl. 250—334 **8 Claims**



1. Line-scanning equipment for scanning a scene over a wide angle, especially in connection with obtaining a photographic record of a terrestrial scene passing beneath an aerial vehicle, wherein the scene is scanned repeatedly in a direction at right angles to the direction of travel of the equipment relative to the scene being scanned and the angle θ of the scanning beam relative to a line generally perpendicular to the nominal plane of the scene being scanned repeatedly varies between zero and a maximum, whereby the area scanned during each complete scan has a "bow-tie" shape, characterized in that a correcting optical lens is employed having a curvature varying in accordance with a secant function of the angle θ, in conjunction with shutter means operative to restrict the recorded image to that part of the recording beam information which is derived from a parallel-sided ground area within the "bow-tie" area.

4,103,161

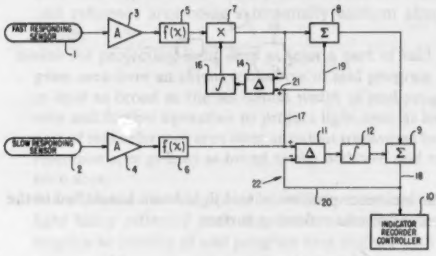
COMPOSITE TRANSDUCER

Frederick Young Thomasson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,638

Int. Cl.[2] G01T *1/16, 3/00*

U.S. Cl. 250—336 **8 Claims**



1. A transducer generating an output signal proportional to the magnitude of a physical condition, comprising, a first prompt responding sensor generating a signal corresponding to the magnitude of the physical condition, a second slow responding sensor generating a signal corresponding to the magnitude of the physical condition of high accuracy relative to the accuracy of the first sensor but having a long time constant relative to the time constant of the first sensor, a circuit responsive to the signals generated by the first and second sensors generating an output signal varying in accordance with changes in the signal generated by the first sensor and including means adjusting the circuit output signal to correspond to the signal generated by the second sensor at a controlled rate.

4,103,162

APPARATUS FOR THE CONTINUOUS MEASUREMENT OF THE CONCENTRATION OF OIL

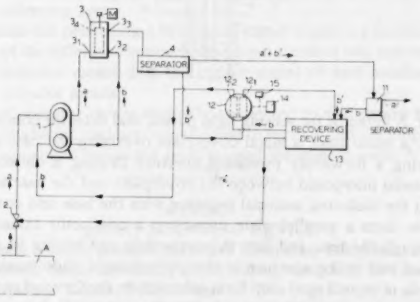
Michinori Iwamoto, and Toshiyuki Nomura, both of Kyoto, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 10, 1976, Ser. No. 749,618

Claims priority, application Japan, Jan. 12, 1976, 51-2642

Int. Cl.[2] G01N *21/34*

U.S. Cl. 250—343 **3 Claims**



1. An apparatus for the continuous measurement of the concentration of oil in a water sample, comprising a supplying device which supplies an oil-containing water sample and a supplying device which supplies a solvent for extracting the oil in the sample, each of said water sample and solvent being supplied in a controlled and continuous amount, an extractor connected to said supplying devices having an agitator therein, which extractor receives said oil-containing water sample and solvent and serves to extract the oil component in the water sample with the solvent; a first separator connected to said

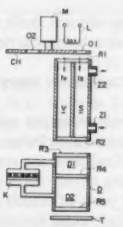
extractor and which receives the mixture of oil-containing solvent and extracted water sample from the extractor and serves to quickly but incompletely separate the oil-containing solvent and extracted water sample, said first separator containing an inlet to receive the mixture of oil-containing solvent and extracted sample from the extractor, a hydrophobic filter to separate the oil-containing solvent from the extracted water sample, one outlet for removing the oil-containing solvent and another outlet for removing a mixture of the extracted water sample and oil-containing solvent which have not been separated; an infra-red analyzer containing two cells for measuring the concentration of oil, one cell being connected directly to the outlet of the first separator for removing the separated oil-containing solvent therefrom and which cell receives said oil-containing solvent and measures the concentration of oil in said oil-containing solvent and a second reference cell; a second separator connected to said first separator for receiving the sample water and the oil-containing solvent not separated in the first separator and which serves to separate the oil-containing solvent from the water sample, said second separator containing an outlet to remove and discard the separated water sample, and an outlet to remove the separated oil-containing solvent; a solvent recovery device connected to both the second separator and the first cell in the infra-red analyzer and which receives the oil-containing solvents from both the second separator and first cell, and which contains an adsorbent to remove the oil from the oil-containing solvent so as to recover the solvent with the oil removed therefrom.

4,103,163

INFRARED GAS ANALYZING APPARATUS

Toshiyoshi Hamada, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 3, 1977, Ser. No. 793,343
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—344 **14 Claims**



1. In an infrared ray gas analyzing apparatus including a measuring vessel for containing a sample or a reference gas and arranged to be intermittently exposed to and transmit therethrough infrared light energy, first and second gas-filled detecting chambers disposed in ordered series after said vessels and axially aligned therewith for absorbing infrared light energy transmitted therethrough, and detecting means coupled between said first and second chambers for sensing pressure variation differences therebetween, the improvements characterized by:

(a) the end of said second chamber most remote from said vessels being transparent to infrared light energy, and

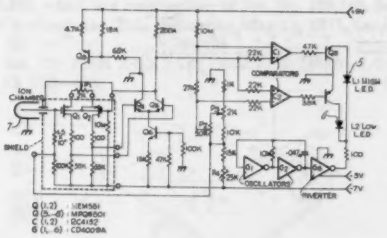
(b) adjustable reflecting means disposed after said second chamber end for reflecting a portion of the infrared light energy transmitted through said end back into said second chamber, whereby the degree of reflection may be suitably adjusted such that any interference gas component in a gas sample being analyzed has an equal influence on the absorbtion characteristics of both the first and second chambers, to thereby render its effects self-cancelling.

4,103,164

RADIACMETER WITH NULL DEFLECTION SYSTEM

Philip C. East, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Jan. 14, 1977, Ser. No. 759,580
Claims priority, application Canada, Mar. 9, 1976, 247484
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—374 **9 Claims**



1. A hand held self contained gamma radiation dose-rate meter comprising: a substantially rigid, pocket sized casing which contains:

(a) power supply means;

(b) radiation detection means which generates an output voltage in the presence of an ionizing radiation and quasi-logarithmically proportional thereto, operatively connected to said power supply means;

(c) means to amplify said output voltage;

(d) linear potentiometer means to compare a reference voltage provided thereby with said output voltage; and

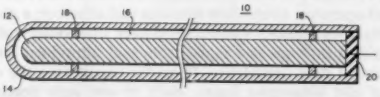
(e) visual means to indicate high and low comparison readings, viewable externally of said casing, thereby defining a null deflection readout system.

4,103,165

NEUTRON RESPONSIVE SELF-POWERED RADIATION DETECTOR

Donald P. Brown, Richland, and Collins P. Cannon, Kennewick, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,625
Int. Cl.[2] G01T *3/00*
U.S. Cl. 250—390 **1 Claim**



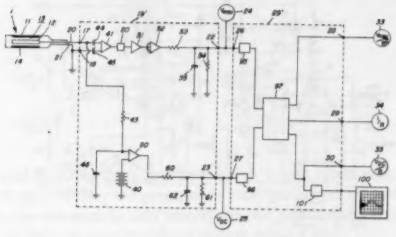
1. A neutron responsive self-powered radiation detector comprising a neutron absorptive, low density, conductive emitter of beryllium, and a substantially neutron transmissive conductive collector sheath of ferro-alloy spaced from and disposed about the emitter, with the space between the emitter and the collector sheath being evacuated.

4,103,166

METHOD AND APPARATUS FOR MONITORING THE OUTPUT OF A NEUTRON DETECTOR

John P. Niessel, San Jose; Walter K. Green, Gilroy, and Yogeshwar Dayal, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 14, 1977, Ser. No. 768,551
Int. Cl.[2] G01T *3/00*
U.S. Cl. 250—391 **21 Claims**



1. A method for monitoring a neutron detector of the type having a chamber filled with an ionizable gas producing an alternating and a direct current both representative of the neutron flux in the chamber and a direct current representative of the gamma radiation in the chamber comprising the steps of:

forming an AC signal, V_{MSV}, proportional to the alternating current in said chamber,

forming a DC signal, V_{DC}, proportional to the direct current in said chamber,

forming a ratio, R, of said AC signal to said DC signal, and

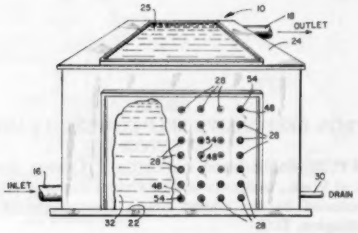
monitoring said ratio, to detect a change in gas density in said chamber.

4,103,167

ULTRAVIOLET LIQUID PURIFICATION SYSTEM

Sidney Ellner, 6 Tudor Pl., Hartsdale, N.Y. 10530

Filed Aug. 16, 1976, Ser. No. 714,777
Int. Cl.[2] G01N *21/24*
U.S. Cl. 250—432 R **12 Claims**



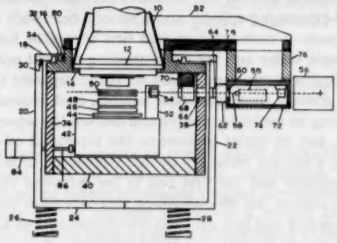
1. An ultraviolet liquid purification system comprising an ultraviolet purification chamber having liquid inlet and outlet ports; a plurality of ultraviolet lamps located within said chamber and operative to irradiate liquid in said chamber; a plurality of ultraviolet sensors located to detect ultraviolet radiation transmitted through said liquid from said ultraviolet lamps; a plurality of light conducting fibers for monitoring the operation of said ultraviolet lamps, each of said light conducting fibers having its endface located in close proximity with a corresponding ultraviolet lamp to directly receive light radiation therefrom; ultraviolet transmission indicator means operative in response to said ultraviolet sensors to produce an ultraviolet transmission indicator signal corresponding to the detected ultraviolet radiation transmitted through said liquid; and lamp condition indicator means associated with said light conducting fibers and operative to produce a lamp condition indicator signal corresponding to the light emitted by said lamps.

4,103,168

ELECTRON BEAM MICROFABRICATION APPARATUS

John Monro Sturrock, Cambridge, and Bernard Allan Wallman, Harston, both of England, assignors to Cambridge Scientific Instruments Limited, England

Filed Jul. 13, 1977, Ser. No. 815,302
Claims priority, application United Kingdom, Jul. 14, 1976, 29204/76
Int. Cl.[2] G21K *5/06*
U.S. Cl. 250—442 **16 Claims**



1. Apparatus for electron beam microfabrication in which a substrate is located on a stage below the final lens of an electron microscope column which includes the final lens at its lower end and in which the stage is moved relative thereto for exposing different fabricated detail on the surface of the substrate comprising:

(a) a mounting in the form of a rigid member having an aperture within which the final lens can be located,

(b) first rigid support means which extends downwardly from the rigid apertured member,

(c) a moveable stage,

(d) at least one reflecting device, both the moveable stage and the reflecting device being carried by the first rigid support means,

(e) second rigid support means for carrying remote interferometer means,

(f) a laser source and receiver means which are mounted in alignment with the remote interferometer means whereby at least the stage, the final lens, the remote interferometer means and the reflecting device form a unitary sub-assembly all the component parts of which are rigidly mounted with respect to the single rigid apertured member.

4,103,169

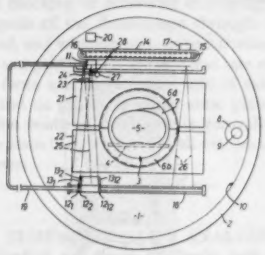
APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION

Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 502,080, Aug. 30, 1974, Pat. No. 3,946,234. This application Jan. 23, 1976, Ser. No. 651,813
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—445 T **5 Claims**

1. Medical radiographic apparatus for investigating a substantially planar region of the body of a patient for the purpose of evaluating the absorption coefficient, with respect to penetrating radiation, at a plurality of elemental locations distributed over said region, the apparatus comprising a rotatable support member having an aperture adapted to receive the part of said body in which said region is located, a motor for causing said support member to rotate about an axis which intersects said region and passes through said aperture, a source of said penetrating radiation, said source being supported by said member and being disposed to project said radiation through said aperture with said radiation fanning out from said source

and in alignment with said region, a bank of radiation-sensitive detectors supported by said support member and disposed to intercept radiation which has traversed said aperture; said detectors being positioned to intercept radiation projected along respective beams of said radiation and arranged to provide output signals indicative of the amount of radiation transmitted along the paths, through the aperture, followed by said beams, the beams diverging as they proceed away from the source, lateral scanning means for moving said source laterally in alignment with said region so as to scan said radiation laterally across said region; the lateral movement of the source



being emulated by the bank of detectors so that, during each lateral scanning motion, each detector provides a group of output signals indicative of the amount of radiation transmitted through said aperture along a respective set of substantially parallel beam paths; the sets being orientated with respect to each other in accordance with the angular separation of the beams, the motor and the lateral scanning means being operatively connected to produce a plurality of lateral scans in which said diverging beams are rotated as a whole by an angle corresponding to the number of beams and their angular separation.

4,103,170

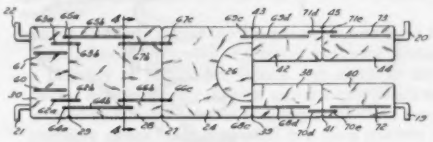
PORTABLE MEDICAL TABLE

Richard V. Spradlin, R.D. 1 Gurda La., Pine Island, N.Y. 10969

Filed Sep. 22, 1977, Ser. No. 835,822

Int. Cl.[2] A61G *1/00, 13/00;* G21K *5/08*

U.S. Cl. 250—451 **4 Claims**



1. In a portable medical table having a rigid base, and a plurality of top sections for supporting different parts of the body overlying the base and positioned in succession along the length of the base and individually adjustable to different positions with respect to each other, each of said support sections having downwardly extending slots which are open at the top for the slidable insertion and removal of X-ray plates, at least certain of said top sections each having a pair of said downwardly extending slots spaced apart laterally to be located on opposite sides of the part of the body supported by that top section,

the improvement wherein successive top sections have downwardly extending, adjoining slots that register with and open toward each other for together receiving a single X-ray plate.

4,103,171

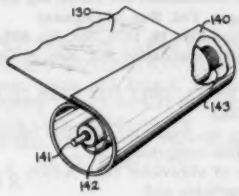
PORTABLE CARTRIDGE CONTAINED ELECTROLUMINESCENT SHEET FOR READING AND WRITING IN THE DARK

Becky J. Schroeder, 2317 Valleybrook Dr., Toledo, Ohio 43615

Continuation-in-part of Ser. No. 639,200, Dec. 9, 1975, which is a continuation-in-part of Ser. No. 567,397, Apr. 11, 1975, Pat. No. 3,978,340, which is a continuation-in-part of Ser. No. 498,705, Aug. 19, 1974, Pat. No. 3,879,611, which is a continuation-in-part of Ser. No. 428,339, Dec. 23, 1973, Pat. No. 3,832,556, which is a continuation of Ser. No. 288,148, Sep. 11, 1972, abandoned. This application May 13, 1977, Ser. No. 796,694

Int. Cl.[2] F21K *7/00, 2/00;* H01J *1/66;* H05B *41/16*

U.S. Cl. 250—458 **10 Claims**



6. A portable containerized electroluminescent light unit comprising an electroluminescent sheet wound into a cylindrical configuration and a cartridge holding said sheet in its wound condition, a power source for said unit being in general centrally contained within said cartridge with said sheet being wound spirally around said power source, said cartridge having an opening from which an edge of the sheet can be withdrawn to extend the sheet for exposure of light emitted therefrom.

4,103,172

NUCLEAR LIGHT SOURCE

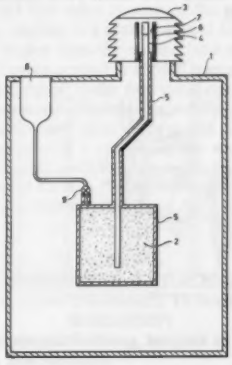
Nigel Lawrence Spottiswoode, Bala, Wales, and David John Ryden, Nr. Wantage, England, assignors to AGA Navigation Aids Ltd., England

Filed Mar. 26, 1976, Ser. No. 670,688

Claims priority, application United Kingdom, Mar. 26, 1975, 12661/75

Int. Cl.[2] F21K *2/02*

U.S. Cl. 250—462 **31 Claims**



1. A light source comprising:

a radio isotope fuel source;

thermal insulation against heat loss surrounding said fuel source;

a biological shield against the escape of ionizing radiation surrounding said fuel source and said thermal insulation;

a material having a surface which attains incandescence when subject to isotope decay heat;

means for transferring energy from said insulated fuel source to produce incandescence of said surface and thereby emit light; and

a filter associated with said surface permitting a relatively high transmission of radiation from the fuel source in the visible spectrum and a relatively high reflectance in the infra red spectrum thereby increasing the luminous efficiency of said light source.

4,103,173

FLUORESCENT SCREEN

Hans-Günter Danielmeyer, Wedel, and Werner Hartmann, Esslingen-Berkheim, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur Forderung der Wissenschaften e. V., Göttingen, Fed. Rep. of Germany

Filed Feb. 19, 1976, Ser. No. 659,469

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1975, 2507877

Int. Cl.[2] G01J *1/58;* **G01N** *21/38*

U.S. Cl. 250—483 **11 Claims**

1. Apparatus for producing a visible image in response to invisible radiation comprising:

(a) a source of ultraviolet rays, X-rays, δ-rays, or rays of charged particles; and

(b) a fluorescent screen exposed to rays from said source and including a layer of fluorescent material, said material being a compound having a formula selected from the group consisting of $(A_2O)_a(Ln_2O_3)_b(P_2O_5)_c$, $(Ln_2O_3)_p(Al_2O_3)_q(B_2O_3)_r$, and $LnZrF_7$

wherein

a is zero or a positive integer not greater than 100, *b, c, p, g,* and *r* are positive integers not greater than 100,

A is at least one alkali metal, and

Ln is at least one rare earth metal, the ions of said rare earth metal being spaced apart in said compound more than 5 Angstrom units.

4,103,174

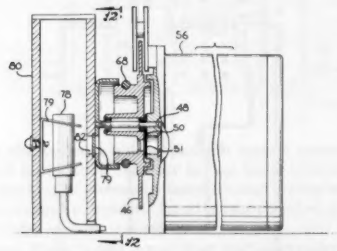
INFRARED SOURCE FOR USE IN AN INFRARED GAS DETECTOR

Edward A. McClatchie; Dean A. Watson, both of Berkeley, and Irvin G. Burough, Walnut Creek, all of Calif., assignors to Andros, Incorporated, Berkeley, Calif.

Division of Ser. No. 509,838, Sep. 27, 1974, Pat. No. 4,013,260. This application Dec. 13, 1976, Ser. No. 749,836

Int. Cl.[2] G21G *4/00;* **G21K** *1/00;* **H05B** *3/10*

U.S. Cl. 250—493 **6 Claims**



1. For use in an infrared gas detector, an infrared source comprising:

an infrared radiation emitting element having first and second electrical connections,

an enclosure for said element having a predetermined transmissive area which is substantially transmissive to infrared radiation to allow infrared radiation from said element to proceed along an optical path, said enclosure including means for supporting said element, in fixed disposition with respect to said transmissive area, the outer surface of said element and the inner surface of said enclosure each having an emissivity of at least 0.7 with respect to infrared radiation.

4,103,175

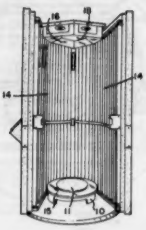
PHOTOTHERAPY IRRADIATION CHAMBER

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 22, 1976, Ser. No. 743,873

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—504 **8 Claims**



1. A phototherapy irradiation chamber having substantial uniformity of irradiance of 320–380 nanometer radiation therewithin comprising an array of vertical fluorescent lamps surrounding the irradiation space, a bottom reflector and a top reflector disposed within the array at the bottom and top respectively of the irradiation space, the ends of the lamps extending beyond the reflectors for the purpose of obtaining said substantial uniformity of irradiance.

4,103,176

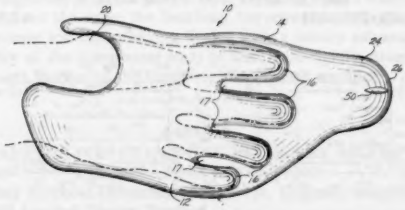
HAND-HELD COMPRESSOR FOR USE BY RADIOLOGIST

Maurice J. Coyle, 3326 Wesleyan Dr., Anchorage, Ak. 99504

Filed Jan. 6, 1977, Ser. No. 757,220

Int. Cl.[2] G21F *3/02*

U.S. Cl. 250—516 **7 Claims**



1. A hand-held compression device for use by radiologists or the like for manipulating or compressing the abdomen to flatten selected portions of the intestinal tract of a patient into whom radiopaque solution of barium sulfate or the equivalent has been injested in order that abnormalities situated in the intestinal tract such as tumors or polyps are visible on a fluoroscope, said compression device comprising:

a relatively strong and broad body portion having first and second opposed, generally parallel faces and being sized to have a width at least equivalent to the palm portion of the user's hand and contoured on at least one face to accommodate the user's fingers thereon and be gripped between the thumb and fingers of the hand with the hand palm open,

a relatively strong and small rounded protrusion projecting

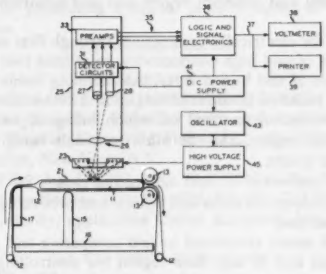
forwardly from the front of said body portion and of a width less than said body portion, said protrusion coacting with said body portion during use and including a generally rounded contact portion situated at the end of said protrusion, and adapted to be used to manipulate the patient's abdomen when the user's hand is gripping said body portion, and wherein at least said contact portion is formed of a radiolucent material so that when the user's hand gripping said body portion is fully enclosed in a radiopaque covering, such as a glove or the like, the contact portion situated forwardly of the user's hand can be used to manipulate and depress the patient's abdomen without blocking or otherwise interfering with the radiated signals of the fluoroscope through the area being evaluated, and wherein said contact portion has a contact surface and said contact surface and one of said first and second faces are on the same side of said compression device and lie generally in the same plane whereby the protrusion being of small area is generally more pliable than the main body and acts as an extension of the fingers of the user.

4,103,177

SURFACE QUALITY ANALYSIS

Richard A. Sanford, and Edwin K. Clardy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 1, 1975, Ser. No. 636,490
Int. Cl.[2] G01N *21/30, 21/32*
U.S. Cl. 250—562 **61 Claims**



1. Apparatus comprising:

light source means for illuminating at least a portion of a surface;

detector assembly means for directing reflected light from said surface to a plurality of detector means for producing a plurality of reflectance signals responsive to the reflected light impinging thereon, said detector means being located within said detector assembly means, said detector assembly means being supported in a fixed position relative to said light source means;

drive means for effecting relative motion between said detector assembly means and said surface to provide scanning of said surface by said detector means; and

means for generating, in response to said plurality of reflectance signals, at least one surface quality signal responsive to the reflective characteristics of said surface;

wherein said detector assembly means comprises a lens and wherein the operative surface of each said detector means is located at the focal plane of said lens, said plurality of detector means being positioned in a preselected array to provide substantially simultaneous detection of reflected light from a plurality of preselected locations past which relative movement of said surface is accomplished during scanning of said surface; wherein said preselected locations comprise a substantially straight line positioned generally perpendicular to the direction of relative motion between the detector assembly means and said surface during scanning of said surface;

wherein there are two said detector means and wherein said means for generating said at least one surface quality signal comprises:

differentiating means associated with each said detector means for differentiating each said reflectance signal to produce a differential signal representative of the rate of change of its associated reflectance signal; and

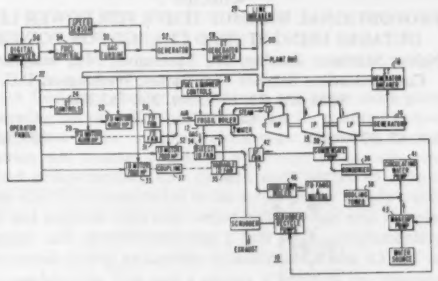
discriminator means for generating, in response to said differential signals, a discriminatory signal which is proportional to the magnitude of the smaller of said differential signals when said differential signals are of the same polarity and which is equal to zero when said differential signals are of opposite polarity.

4,103,178

BLACK START SYSTEM FOR LARGE STEAM POWERED ELECTRIC GENERATION PLANTS

Robert A. Yannone, Aldan, and John F. Reuther, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,688
Int. Cl.[2] F02N *11/06*
U.S. Cl. 290—40 R **7 Claims**



1. A system for black starting a large fossil fired electric power plant having a boiler and a steam turbine-generator and large electric motors and other smallar auxiliary loads which must be energized electrically before the steam turbine-generator can become operational, said system comprising a gas turbine-generator having a fuel system with a fuel valve, means for operating said fuel valve to control the gas turbine speed during and after startup to a predetermined limit speed higher than rated and higher than the normal limit speed, means for setting said fuel valve control in a black start mode in which a load rate limit is applied to the fuel valve operation only if an actual load step exceeds a predetermined limit amount, means for applying the auxiliary plant loads to said gas turbine-generator in accordance with a predetermined sequence after the latter has been started, and means for connecting the steam and gas turbine generators to a common bus after the steam turbine-generator has been started.

4,103,179

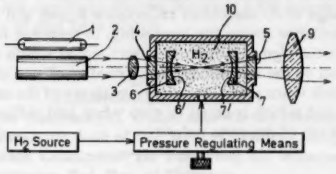
APPARATUS FOR STIMULATED EMISSION OF COHERENT, CONTINUOUSLY TUNABLE RAMAN RADIATION

Werner Schmidt, Aalen, Germany, assignor to Lambda Physik GmbH & Co. KG, Germany

Continuation of Ser. No. 314,462, Dec. 12, 1972, abandoned.
This application Jul. 15, 1974, Ser. No. 488,404
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1971, 2161743
Int. Cl.[2] H03F *7/00*
U.S. Cl. 307—88.3 **9 Claims**

1. Apparatus for producing coherent radiation which is

continuously tunable over the wavelength range from the UV to the far IR, said apparatus comprising a resonator including wavelength-selection means and filled with a Raman-active medium which will displace stimulating radiation from a frequency ν by a fixed amount



$\Delta\nu$, an optical stimulator for said resonator comprising at least one dye laser and having an output radiation characteristic which is continuously tunable with small-line width over the frequency range $\Delta\nu$, and selectively operable means for tuning within said range and with small-line width the transmission of light from said laser to said medium.

4,103,180

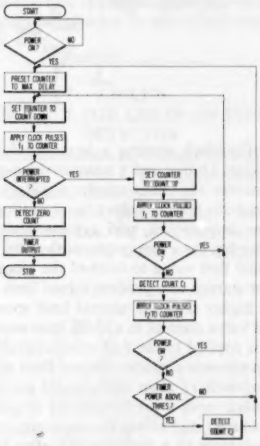
PROPORTIONAL WARMUP TIMER FOR POWER LINE OUTAGES USING STORED CHARGE FOR POWER

Nelson Mortimer Jacobus, Jr., Kensington, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,206

Int. Cl.[2] H03K *17/28*

U.S. Cl. 307—141 **10 Claims**



1. A proportional warmup timer responsive to power line outages for proportioning the warmup delay for equipment supplied by said power line to the time of power loss, said timer comprising:

means connected to said power line for detecting a power line outage,

an up/down counter,

means responsive to said detecting means for controlling said up/down counter to count in a first direction at a first rate when a power line outage is detected and to count in a second direction at a second rate when power is restored, and

means for decoding the output of said up/down counter and generating a timer output when a first predetermined count is reached.

4,103,181

MONOLITHIC INTEGRATED TRANSISTOR AND PROTECTIVE CIRCUIT THEREFOR

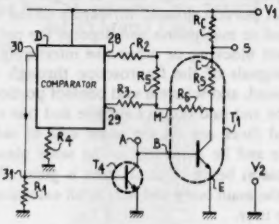
Jean Michel Moreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 2, 1976, Ser. No. 710,880

Claims priority, application France, Aug. 5, 1975, 75 24427

Int. Cl.[2] H03K *17/00*

U.S. Cl. 361—86 **9 Claims**



1. A protective device for a monolithic integrated transistor formed on a semi-conductive substrate of a first conductivity type and having a first collector region of a second conductivity opposite to said first conductivity formed on said substrate, a second base region of said first conductivity type formed on said first region, a third emitter region of said second conductivity type formed on said second region, and a fourth buried region of low resistivity and of said second type of conductivity between said collector region and said substrate, comprising:

means for electrically connecting, through first and second wells of said high conductivity, to at least two separated points of said buried layer, thus defining inside this layer two resistive portions arranged in a two-resistor bridge, the common terminal of which being opposite to the emitter region, and the other terminals being said separated points;

means connected to said connecting means for comparing the voltage between said points, and producing a control signal; and

control means connected to said comparing and producing means and to said base region for controlling the base voltage as a function of said control signal, to thus protect said transistor against overload.

4,103,182

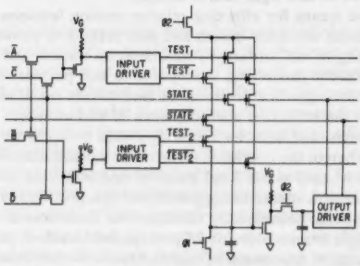
PROGRAMMABLE TRANSFER GATE ARRAY

Havyn E. Bradley, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 1, 1976, Ser. No. 719,541

Int. Cl.[2] H03K *19/20, 19/08;* G06F *7/38*

U.S. Cl. 307—203 **1 Claim**



1. Apparatus for generating a digital control signal as a

function of a plurality of digital input signals having first and second logic states, the apparatus comprising:

storage means for storing a signal applied thereto;

a pre-driver connected to said storage means for selectively applying a first signal thereto;

a line driver for selectively generating a second signal;

first and second transfer lines each connected between said line driver and said storage means and responsive to a selected first and second set of digital input signals respectively, each for transferring the second signal to said storage means in response to all of the selected digital input signals having the first value and said line driver generating the second signal;

input means having a first output coupled to said first transfer line for generating a digital input signal of the first set having a logic state representative of a signal applied thereto and having a second output coupled to said second transfer line for generating a digital input signal of the second set having a logic state representative of the complement of the signal applied thereto;

means for generating third and fourth signals;

a third transfer line connected for selectively applying the third signal to said input means in response to a selected subset of the first set of digital input signals attaining the first logic state;

a fourth transfer line connected for selectively applying the fourth signal to said input means in response to a selected subset of the second set of digital input signals attaining the first logic state; and

output means connected to said storage means for selectively detecting the value stored by said storage means and for generating a digital control signal in response thereto.

4,103,183

QUASI-STATIC INVERTER CIRCUIT

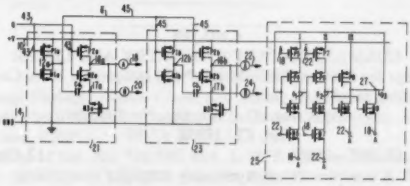
Bruce David Rosenthal, Highland Park, and Andrew Gordon Francis Dingwall, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 578,913, May 19, 1975, Pat. No. 4,000,412. This application Oct. 15, 1976, Ser. No. 732,785

Claims priority, application United Kingdom, Jun. 5, 1974, 24898/74

Int. Cl.[2] H03K *19/40, 19/08*

U.S. Cl. 307—214 **2 Claims**



1. The combination comprising,

a first conductor adapted to receive a first potential;

second and third conductors adapted to receive complementary pulsating potentials;

first, second and third transistors, each transistor having first and second electrodes defining the ends of a conduction path and a control electrode; said first transistor being of one conductivity type and said second and third transistors being of opposite conductivity type;

an output terminal;

means connecting the conduction path of said first transistor between said first conductor and said output terminal;

means connecting the conduction paths of said second and third transistors between said output terminal and said second and third conductors, respectively;

an input terminal for the application thereto of a signal to be inverted; and

means for connecting the control electrodes of said first, second and third transistors to said input terminal.

4,103,184

FREQUENCY DIVIDER WITH ONE-PHASE CLOCK PULSE GENERATING CIRCUIT

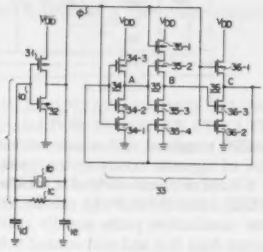
Yasoji Suzuki, Ayase, and Tadashi Kuroda, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,102

Claims priority, application Japan, Sep. 12, 1975, 50-109942

Int. Cl.[2] H03K *21/00, 23/08*

U.S. Cl. 307—225 C **8 Claims**



1. A frequency divider comprising a one-phase clock pulse generating circuit and at least one counter for counting output clock pulses of the one-phase clock pulse generating circuit, wherein said counter comprises a plurality of cascade connected complementary unit circuits, each formed of at least three IGFETs connected in series across power supply terminals and supplied with said output clock pulses, said complementary unit circuits including a first stage complementary unit circuit having an inverter consisting of a first IGFET of one conductivity type and a second IGFET of the opposite conductivity type and a third IGFET connected between one of said power supply terminals and one of said first and second IGFETs and having a gate to receive said output pulses, and a last stage complementary unit circuit having fourth and fifth IGFETs having gates connected to the output of the one-phase clock pulse generating circuit and a sixth IGFET connected between the fourth and fifth IGFETs, said sixth IGFET having a gate connected to an output of a preceding complementary unit circuit, and the output of the last stage complementary unit circuit being supplied to an input of the inverter of the first stage complementary unit circuit and to at least one IGFET of each complementary unit circuit other than said first and last stage complementary unit circuits.

4,103,185

MEMORY CELLS

George Denes, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 663,752, Mar. 4, 1976. This application Dec. 16, 1977, Ser. No. 861,365

Int. Cl.[2] G11C *11/40;* **H03K** *3/286, 3/353*

U.S. Cl. 307—238 **4 Claims**

1. A memory cell comprising, in combination:

first and second digit lines;

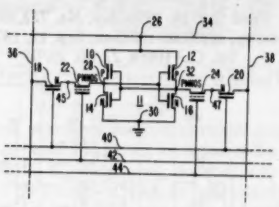
first, second and third control lines;

a first inverter utilizing complementary conductor-insulator-semiconductor (CIS) transistors having input and output points, said input point connected to a first cell node and said output point connected to a second cell node;

a second inverter utilizing complementary CIS transistors having input and output points, said second inverter input

point connected to said second cell node and said second inverter output point connected to said first cell node;

a conductor-insulator-semiconductor (CIS) transistor and a variable threshold transistor of opposite conductivity types, each transistor having a control electrode and a conduction path, said CIS transistor and said variable threshold transistor conduction paths serially connected between said first digit line and said first cell node, said CIS transistor control electrode connected to said first control line and said variable threshold transistor control electrode connected to said second control line; and



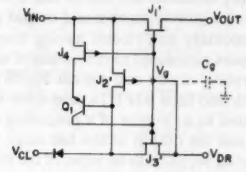
a second CIS transistor and a second variable threshold transistor of opposite conductivity types, each transistor having a control electrode and a conduction path, said second CIS transistor and said second variable threshold transistor conduction paths serially connected between said second digit line and said second cell node, said second CIS transistor connected to said first control line and said second variable threshold transistor connected to said third control line.

4,103,186

LOW POWER JFET SWITCH

José F. Albarrán, Mexico City, Mexico, and Adib R. Hamade, Cupertino, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 24, 1977, Ser. No. 780,932
Int. Cl.² H03K *17/04, 17/68;* **H01L** *29/80*
U.S. Cl. 307—251 **2 Claims**



1. In a transistor switching circuit comprising a pass transistor, having source, gate, and drain, with its source connected to an input and its drain connected to an output; a fist turn-on transistor, having source, gate, and drain, with its drain connected to a clamping circuit and its source connected to a source of drive current; and a second turn-on transistor, having source, gate, and drain, with its source connected to the source of said pass transistor and its drain connected to the drain of said first turn on transistor; said pass and said first and second turn on transistors having a common gate connection; the improvement for obtaining a low idle power consumption comprising:

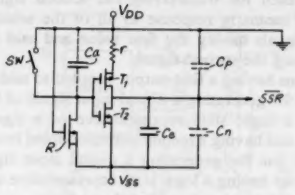
a bipolar transistor, having emitter, base, and collector, wherein said collector is connected to said common gate connection and said base is connected to the drain of said first turn on transistor such that said bipolar transistor turns on only during the transition from the open to closed condition of said first and second turn on transistors to thereby discharge the common gate capacitance of said transistors.

4,103,187

POWER-ON RESET SEMICONDUCTOR INTEGRATED CIRCUIT

Yoichi Imamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Sep. 20, 1976, Ser. No. 724,496
Claims priority, application Japan, Sep. 19, 1975, 50-113269
Int. Cl.² H03K *17/22, 17/20, 17/60, 21/32*
U.S. Cl. 307—251 **14 Claims**



1. In a semiconductor integrated circuit chip having digital circuit means formed of MOS transistors constructed and arranged on a substrate to define a predetermined parasitic capacitance, the improvement comprising a voltage supply means including a reference terminal and a supply voltage terminal for selectively applying to said digital circuit means a supply voltage for operating said digital circuit means at said supply voltage, and reset circuit means disposed intermediate said supply voltage terminal and said reference terminal, said reset circuit means including at least first and second complementary coupled opposite polarity MOS transistor means coupled to define an output terminal having said predetermined parasitic capacitance thereat, said first transistor means being further coupled to said reference terminal and said second transistor means being further coupled to said supply voltage terminal so that said first transistor means is turned ON and defines a predetermined resistance between said reference terminal and said output terminal when said supply voltage is initially applied to said reset circuit means and defines in series with at least said parasitic capacitance between said output terminal and said supply voltage terminal an RC constant so that a reset signal is applied at said output terminal to said digital circuit means a predetermined interval of time after said supply voltage is initially applied to said reset circuit means and digital circuit means.

4,103,188

COMPLEMENTARY-SYMMETRY AMPLIFIER

George Ira Morton, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,694
Int. Cl.² H03K *17/60*
U.S. Cl. 307—251 **12 Claims**

12. A complementary-symmetry amplifier comprising:

a first voltage source;

a second voltage source;

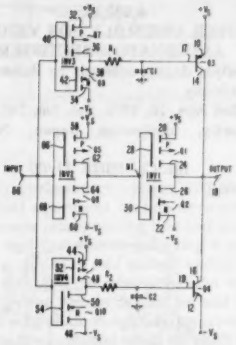
an input terminal for receiving an input signal potential which alternates between first and second levels, which first level is closer to the potential of the first voltage source than the potential of the second voltage source, and which second level is closer to the potential of the second voltage source than the potential of the first voltage source;

an output terminal;

first and second inverter means, each having a respective input connection to which the input terminal connects for applying the input signal potential thereto, each having a respective first power supply connection connected to the first voltage source, each having a respective second power supply connection connected to the second voltage source, each having a respective output connection at

which appears respective potentials substantially equal to that of the first voltage source responsive to the second level of the input signal potential and substantially equal to that of the second voltage source responsive to the first level of the input signal potential;

a bipolar transistor having a base electrode to which the output connection of the first inverter means is connected, having an emitter electrode connected to the first voltage source, having a collector electrode connected to the output terminal, and being of a conductivity type switched into conduction whenever the potential at the output connection of the first inverter means is substantially equal to that of the second voltage source in response to the first level of the input signal potential, for



relatively rapidly pulling the potential at the output terminal towards the potential at its emitter electrode; and

an enhancement-mode FET having a gate electrode to which the output connection of the second inverter means is connected, having a source electrode connected to the first voltage source, having a drain electrode connected to the output terminal, and being of a conductivity type switched into conduction whenever the potential at the output connection of the second inverter means is substantially equal to that of the second voltage source in response to the first level of the input signal potential, for pulling the potential at the output terminal to a potential substantially the same as the potential at its source electrode.

4,103,189

MOS BUFFER CIRCUIT

George Perlegos, Santa Clara, and Phillip J. Salsbury, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 728,789, Oct. 1, 1976. This application Jul. 25, 1977, Ser. No. 818,447

Int. Cl.[2] H03K *3/353, 19/08, 19/40*

U.S. Cl. 307—270 **3 Claims**

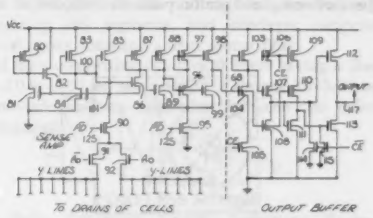
1. A stage for a metal-oxide-semiconductor (MOS) buffer comprising:

an enhancement mode, field-effect transistor having a gate coupled to receive an input signal for said stage;

a load coupled in series with said enhancement mode transistor for providing an output signal from said stage between said enhancement mode transistor and said load;

a second field-effect transistor having a threshold voltage approximately equal to zero volts, said second transistor coupled in series with said enhancement mode transistor and said load, the gate of said second transistor coupled to receive a timing signal;

whereby, by the application of said timing signal to said gate of said second transistor, substantially no voltage drop loss occurs in said stage across said second transistor, and whereby, when said timing signal is removed from said gate of said second transistor, current flow in said stage is



reduced, thereby reducing the power consumed by said stage.

4,103,190

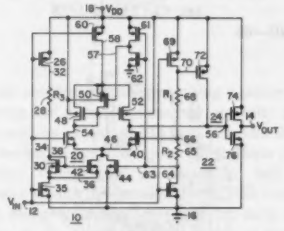
COMPLEMENTARY POWER SAVING COMPARATOR/INVERTER CIRCUITS

Robert Russel Beutler, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1977, Ser. No. 781,076

Int. Cl.[2] H03K *17/30, 17/60;* **H03F** *3/45;* **H03K** *17/04*

U.S. Cl. 307—362 **6 Claims**



1. A circuit having a precise transition point comprising: input means for receiving an input signal; first and second voltage conductors; reference means coupled between said first and second voltage conductors for producing a reference voltage; first amplifier means coupled to said reference means for producing an amplified signal in response to said input signal, said amplified signal having a first transition point determined by said reference voltage; second amplifier means coupled to said first amplifier means for producing an amplified inverted output signal having a second transition point determined by said first transition point in response to said amplified signal; and first power control means for selectively electrically coupling said reference means to said first or second power conductors in response to said input signal.

4,103,191

STEP MOTOR

Yoshikazu Kawamura, Shimosuwa, and Hiroshi Eguchi, Suwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 3, 1974, Ser. No. 476,011

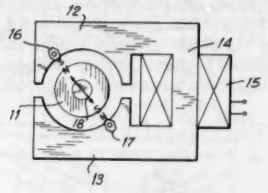
Claims priority, application Japan, Jun. 1, 1973, 48-61522; Jun. 5, 1973, 48-63127

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—49 R **9 Claims**

1. In a step motor having a rotor magnetized to have a pair of magnetically opposed circumferentially spaced poles said rotor being adapted to rotate a complete revolution in response to each pulse applied to said motor, the improvement comprising magnetic positioning means adapted to produce a first flux field for magnetically positioning said rotor in a rest position,

and two stator poles surrounding said rotor and defining a substantially uniform gap between said stator poles and said rotor, said stator pole portions in facing relationship defining a gap therebetween, said stator poles in response to a pulse



applied thereto being adapted to produce a second flux field sufficient to overcome the flux field positioning said rotor in a rest position, said second flux field effecting a complete rotation of said rotor.

4,103,192

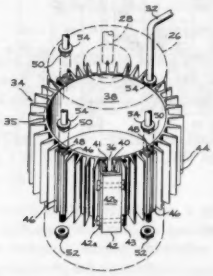
HEAT DISSIPATING MOTOR MOUNTING ARRANGEMENT

Michael E. Wendt, and Danny D. Beaver, both of Tyler, Tex., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 14, 1976, Ser. No. 695,940

Int. Cl.[2] H02K *5/18*

U.S. Cl. 310—64 **2 Claims**



1. In a mounting arrangement for supporting a fan motor, a housing having an opening in a wall portion for passing air between said housing and the ambient surroundings, means for dissipating heat from said motor, comprising:

a split ring mounting member having an inner wall portion dimensioned to embrace the outer wall surface of said motor;

a plurality of parallel circumferentially spaced heat dissipating means being formed integral with said split ring mounting member projecting radially outwardly and extending substantially the full axial dimension of said support member;

circumferentially spaced support elements being formed integral with said split ring mounting member and arranged substantially parallel to said heat dissipating means, said support elements including wall portions providing a channel extending through said support elements;

support arms equal in number to said support elements having a first end secured in a channel of a corresponding support element and having their other end attached to the wall portion adjacent said housing opening so as to center the rotational axis of said motor relative to said opening;

said first end of said support arm and said channel defined by said wall portion of said support element having mating cross-sectional configurations sufficient to prevent relative axial rotation therebetween;

holding means for securing said split ring to said motor including flange members formed integral with said split ring member being arranged on the end portions of said ring adjacent substantially the full length of said split; and

clamping means dimensioned to engage said flange members including means for urging said flange members toward each other so that the inner wall portion of said split ring member is maintained in engagement with the outer surface of said motor with sufficient pressure to prevent relative movement therebetween; and to provide a low resistance thermal conductive path between the motor and the motor support member.

4,103,193

RECTIFIER ASSEMBLY FOR VEHICULAR ALTERNATOR-RECTIFIER

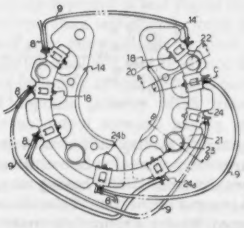
Nobuo Ito, Kariya, Japan, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 10, 1976, Ser. No. 740,510

Claims priority, application Japan, Nov. 28, 1975, 50/161734[U]

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 D **10 Claims**



1. A rectifier assembly for mounting in a three-phase alternator of a motor vehicle to form an alternator-rectifier unit and comprising at least six diodes and also:

an insulating mounting-base member (**21**) substantially in circularly arcuate shape with a circumferential dimension not less than 240° nor more than 320° of arc about an axis and with a radial dimension, not counting integral collars provided for assembly purposes, not greater than 25% of its average radius;

two heat-sink plates (**14,14'**) fastened to said mounting-base member (**21**) substantially on opposite sides of said axis, insulated from each other thereby and serving as connecting busses having means for connection to the d.c. output terminals of said alternator-rectifier unit, said heat-sink plates and mounting-base member being mechanically mountable on said connection means;

at least six diodes, each mounted on one of said heat-sink plates with one electrode of said diode connected to the heat-sink plate and each having an axial connection lead for its other electrode extending away from said diode, said diodes being mounted in radially off set relation to said base-member so that their respective axial leads are parallel to each other and, because of said off set relation, pass by rather than through said insullating member;

a multiplicity of circuit connection members (**24**) running at least in part radially with respect to said axis and having lugs for connection of connecting leads thereto, said connection members being distributed circumferentially on and affixed to said mounting-base member and said lugs including lugs respectively for connection to a lead of each of said diodes and lugs for connection to at least three leads of a stator winding of said alternator, the lugs for connection to said stator winding leads being provided on said connection member at a radial distance from said

axis different from the radial distance of said lugs for connection to said diode leads.

4,103,194

VOLTAGE GENERATORS

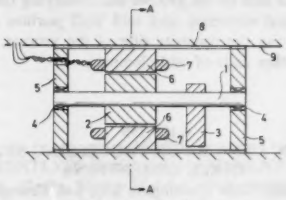
Antony Faithfull Anderson, Newcastle upon Tyne, England, assignor to Reyrolle Parsons Limited, England

Filed May 10, 1977, Ser. No. 795,547

Claims priority, application United Kingdom, May 13, 1976, 19830/76

Int. Cl.[2] H02K *13/14*

U.S. Cl. 310—68 D **5 Claims**



1. In a battery replacement system for providing direct current to electrical equipment, an improvement comprising:

a voltage generator incorporating first and second mechanical systems, said first system including a shaft supported by bearings mounted in said second system whereby said systems are arranged for relative motion to one another, and off-axis biasing weight carried on said shaft and having sufficient magnitude to restrain, by gravitational force, th first system from rotation when the shaft is horizontally oriented and the second system is rotated about an axis coincident with the shaft axis, a permanent magnet forming part of one of the systems, and an armature winding carried by the other whereby rotation of the second system about the first causes an alternating current to be induced in the armature winding; and

a bridge rectifier circuit electrically connected to the armature winding for rectifying the alternating current into an unregulated direct current; and

a voltage regulator electrically connected to said d.c. current of said bridge rectifier, said regulator providing a regulated direct current supply for said electrical equipment.

4,103,195

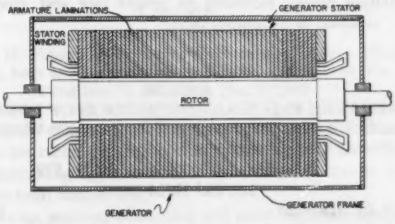
BONDED LAMINATIONS FORMING A STATOR CORE

Kevork A. Torossian, Schenectady, and Alexander L. Lynn, Duanesburg, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 713,440, Oct. 7, 1976. This application Mar. 25, 1977, Ser. No. 781,439

Int. Cl.[2] H02K *1/12, 1/06*

U.S. Cl. 310—259 **9 Claims**



1. A bonded stator core, for a dynamoelectric machine, which comprises

(a) a multiplicity of steel segments stacked in the configuration of said core, each segment of at least a portion of said core being bonded to and insulated from the adjacent segment and

(b) an interlayer between said segments for bonding and insulating said segments, said interlayer comprising a cured epoxy resin and a fiber spacer filler,

said filler comprising cylindrical fibers having a diameter of 0.45–0.55 mil and a length of about 1/64–1/32 inch to provide uniform separation between the individual segments.

4,103,196

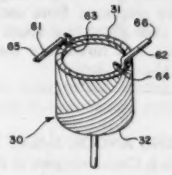
CORELESS MOTOR

Yutaka Saito, Takatsuki; Youichi Yamamoto, Kyoto, and Hajime Kojima, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Continuation-in-part of Ser. No. 615,116, Sep. 19, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 843,038

Int. Cl.[2] H02K *1/22*

U.S. Cl. 310—266 **1 Claim**



1. A miniature coreless motor comprising a stator including a cylindrical yoke and permanent magnet centrally positioned in said yoke providing an annular air gap between the magnet and the yoke having pole-pitch zones of alternate polarity, a cylindrical rotor comprising an insulated coil winding mounted rotatably within the annular air gap, the convolutions of the winding being wound progressively so as to be turned back alternately at the respective end edges to form axially re-entrant bends, with the convolutions of the winding forming an inner layer of wire and an outer layer of wire, each convolution being made up of elements which are angularly related so that each convolution passes through pole-pitch zones of different polarity, the elements forming the inner and outer layers crossing one another at an angle to form a thin cylindrical two-ply construction in which the end edges are rigid and occupy parallel planes, one of the end edges having the axially facing insulation superficially removed to expose a conductive surface at the outer periphery of each re-entrant bend, and a pair of brushes of resilient spring metal providing localized axial contact with the exposed conductive surfaces of the winding at peripherally spaced points on the one end edge for feeding electric current to the winding.

4,103,197

CYLINDRICAL CORE WITH TOROIDAL WINDINGS AT ANGULARLY SPACED LOCATIONS ON THE CORE

Keisuke Ikegami, Tokyo, and Susumu Hoshimi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 666,672

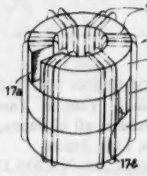
Claims priority, application Japan, Mar. 19, 1975, 50-37043[U]

Int. Cl.[2] H02K *1/22*

U.S. Cl. 310—267 **4 Claims**

1. An electrical device having a cylindrical magnetic core of magnetic material, said core being provided with an axial slot extending radially therethrough to provide said core with a corresponding slot extending along the entire axial length of the core for receiving pre-wound toroidal coils through said slot; a plurality of pre-wound toroidal coils being dimensioned

to pass through said slot of said core and defining a passage through which said core passes, said pre-wound cores extending about said core at angularly spaced locations thereon; and in which said core includes a plurality of annular core elements axially superposed on each other to form said core and each having an axial slot so that, with said core elements arranged axially to align their respective slots, the latter define said



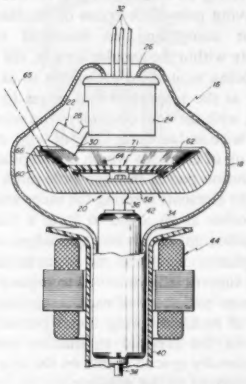
corresponding slot of the core along the entire axial length of the core through which said pre-wound toroidal coils can pass for installation on said core; said core elements being rotatable with respect to each other so as to be arranged their respective slots circumferentially displaced from each other with said pre-wound toroidal coils extending about said elements for reducing the magnetic flux turbulence that may occur as a result of said axially aligned slots.

4,103,198

ROTATING ANODE X-RAY TUBE

Martin Braun, Stamford, Conn., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,043
Int. Cl.[2] H01J *35/08*
U.S. Cl. 313—60 **18 Claims**



1. A target for rotating anode x-ray tubes comprising an annular body adapted to be rotated about its axis and having one surface inclined to the horizontal and having an annular groove in said inclined surface, and a focal track ring disposed on said inclined surface of said body, said ring comprising an array of pinlike elements located within said groove and extending in side-by-side relation throughout the length of the groove and adapted to be urged toward the bottom surface of the groove by centrifugal force during rotation of the body, said body having an integral annular raised land portion along the inner side of the groove and overlying one end of a majority of said elements, and said body having an integral lip portion which overlies the other ends of said elements.

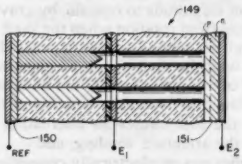
10. An x-ray tube comprising an envelope, an anode structure rotatably supported in the envelope, a cathode structure supported within the envelope in spaced relation to the anode structure, said anode structure including an axially extending shaft, a target supported by said shaft for rotation therewith, and a connecting portion securing said target to the shaft, the target comprising an annular wall portion extending angularly from the periphery of the connecting portion and having one surface inclined to the horizontal and having an annular groove in said inclined surface, and a focal track ring disposed on said inclined surface of said wall portion, said ring comprising an array of pinlike elements located within said groove and extending in side-by-side relation throughout the length of the groove and each extending substantially radially of the target and adapted to be urged toward the bottom surface of the groove by centrifugal force during rotation of the target, said wall portion having an integral raised annular land portion along the inner side of the groove and overlying one end of a majority of said elements, and said wall portion having an integral lip along the opposite side of the groove, which lip overlies the other ends of said elements.

4,103,199

ELECTRONIC DEVICE FOR PROCESSING SIGNALS IN THREE DIMENSIONS

Charles Redman, 2020 Huntington Dr., Los Cruces, N. Mex. 88001, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 556,525, Mar. 7, 1975, Pat. No. 3,982,147.
This application Jun. 14, 1976, Ser. No. 695,489
Int. Cl.[2] H01J *39/06, 31/49*
U.S. Cl. 313—101 **4 Claims**



1. An area and time processing electronic device comprising:
an electrical insulator having opposed input and output faces;
a planar control grid, intermediate the input and output faces and substantially parallel thereto being integral with and traversing the electrical insulator, the combination of electrical insulator and control grid providing a plurality of parallel evacuated chambers which are continuous between the input and output faces;
a plurality of conducting fibers occupying the parallel evacuated chambers extending from the input face and terminating short of the control grid;
a layer of pyroelectric material deposited on the input face so as to seal the evacuated chambers;
a thin film conductor deposited on the pyroelectric material so as to sandwich the pyroelectric between the input face and the thin film conductor; and
output means, including an output face seal, electrically coupled to the output face.

4,103,200

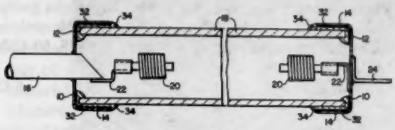
ARC TUBE END SEAL AND METHOD OF FORMING

Ranbir S. Bhalla, West Paterson, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 13, 1977, Ser. No. 796,579
Int. Cl.[2] H01J *61/30*
U.S. Cl. 313—221 **4 Claims**

3. An arc tube for a high pressure sodium discharge lamp comprising:
an elongated tubular ceramic arc tube body member;

a pair of refractory metal end caps having a silicon metal coating on the interior surface thereof sealed to and clos-



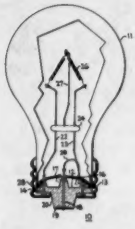
ing off the ends of said elongated tubular ceramic arc tube body member.

4,103,201

CEMENTLESS BASE INCANDESCENT LAMP

Frederick A. Mosby, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,799
Int. Cl.[2] H01J *5/48, 5/50*
U.S. Cl. 313—318 **15 Claims**



1. A cementless base incandescent lamp comprising:
a mount comprising an electrically non-conductive disc having a plurality of conductive pins, some of which extend through said disc;
a glass envelope having a neck portion;
a solder glass seal joining said disc to the end of said neck portion to form a gas-tight enclosure; and
a base having a plurality of holes corresponding to the pins extending through said disc, said pins being inserted into said holes and fastened, thereby attaching the base to said lamp without the use of cement.

4,103,202

ION PROJECTOR HEAD

Richard H. Finger, Hollywood, and Thomas J. Michel, Miami Lakes, both of Fla., assignors to Klykon, Inc., Miami, Fla.

Filed Dec. 3, 1976, Ser. No. 747,377
Int. Cl.[2] H01J *1/16, 19/10*
U.S. Cl. 313—336 **18 Claims**

1. An ion cloud projection head for use with free-air ion-cloud generating apparatus utilizing a point electrode, the projector head comprising:
an ion cup, said cup containing said point electrode therein pointed towards the mouth of the cup; and
an iris plate having an aperture therethrough overlaying the mouth of said ion cup; a cylinder with an aperture therethrough attached to the closed end of said cup; support means fastened externally to the closed end of said cup;

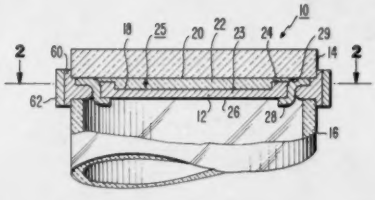
and cylindrical stem means having an aperture therethrough sufficent to recieve said cylinder therein.

4,103,203

WAFER MOUNTING STRUCTURE FOR PICKUP TUBE

Stefan Albert Ochs, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 9, 1974, Ser. No. 504,355
Int. Cl.[2] H01J *31/38, 29/02*
U.S. Cl. 313—390 **8 Claims**



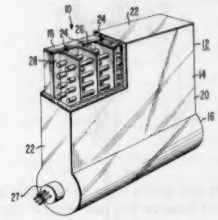
1. A pickup tube comprising:
(a) an evacuated glass envelope having a transparent glass faceplate closing one end of said envelope;
(b) a wafer including a light receiving surface portion mounted to an inner surface of said faceplate by an intermediate layer of highly transparent adhesive, said layer of adhesive including a peripheral surface portion, not in contact with said wafer and faceplate, and extending about said light receiving surface portion of said wafer; and
(c) a low vapor pressure sealant material extending over and substantially covering said peripheral surface portion of said adhesive to substantially prevent outgassing of said adhesive within the evacuated interior of said envelope, said sealant material being conductive and extending across a surface portion of said wafer to an electrical connector extending external to said envelope.

4,103,204

FLAT DISPLAY DEVICE WITH BEAM GUIDE

Thomas Lloyd Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,490
Int. Cl.[2] H01J 29/72, 31/00
U.S. Cl. 313—422 29 Claims



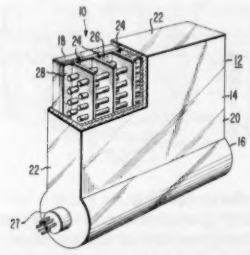
1. An electron display device comprising:
an evacuated envelope having a front wall,
a phosphor screen on the inner surface of said front wall,
means in said device for generating a beam of electrons and directing said beam in a path generally parallel to and across said front wall, and
means along said beam path for causing said beam to travel in a substantially confined undulating path with the undulations thereof toward and away from said screen, and for selectively deflecting said beam out of said path toward said phosphor screen at selected points along said path.

4,103,205

FLAT DISPLAY DEVICE WITH BEAM GUIDE

Thomas Lloyd Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 607,490, Aug. 25, 1975. This application Dec. 1, 1976, Ser. No. 746,213
Int. Cl.[2] H01J 29/70, 29/08
U.S. Cl. 313—422 25 Claims



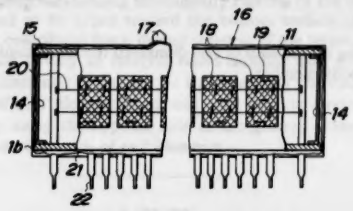
1. An electron display device comprising:
an evacuated envelope having a front wall, a phosphor screen on the inner surface of said front wall,
means in said device for generating a beam of electrons and directing said beam in a path generally parallel to and across said front wall,
means along said beam path for causing said beam to travel in a substantially undulating path with the undulations thereof toward and away from said screen and for selectively deflecting said beam out of said path toward said phosphor screen at selected points along said path, and
means along said path for laterally confining the electrons to a relatively narrow beam.

4,103,206

FLAT TYPE MULTI-DIGIT INDICATING APPARATUS

Goro Eto, and Chuichi Hikida, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Chiba, Japan

Filed May 6, 1976, Ser. No. 683,934
Claims priority, application Japan, May 8, 1975, 50-61046[U]
Int. Cl.[2] H01J 5/02, 5/20, 63/02
U.S. Cl. 313—513 6 Claims



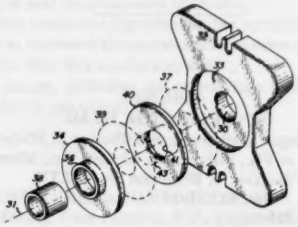
1. A flat type multi-digit indicating apparatus comprising:
a base plate on which a plurality of indicia forming means are arranged in a row in spaced side-by-side relation along the width of said base plate,
means for applying voltage to said indicia forming means for effecting multi-digit indication;
a channel plate having a flat transparent upper viewing window and a pair of side walls provided in face-to-face relation along upper and lower side lengths of said viewing window, said viewing window and said side walls being integrally formed, said channel plate being provided with open side ends,
a pair of strips for blocking the open side ends of said channel plate, each said strip being formed in a flattened U-shape and inlaid between said side walls of said channel plate wherein the legs of each of said U-shape strips ared connected to said side walls.
said channel plate and said strips being bonded together thereby to form a cover having said upper viewing window and said side walls, and
said cover mounted on a front surface of said base plate and forming an hermetically sealed chamber with said base plate which contains said indicia forming means.

4,103,207

COUPLED CAVITY TYPE TRAVELING WAVE TUBE HAVING IMPROVED POLE PIECE STRUCTURE

Edwin George Chaffee, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Mar. 11, 1977, Ser. No. 776,497
Int. Cl.[2] H01J 25/34
U.S. Cl. 315—3.5 4 Claims



1. In a coupled cavity type traveling wave tube of the type containing a plurality of serially spaced interaction cavities defined in the space between adjacent pole piece walls of ferromagnetic material and nonmagnetic metal spacers between pole pieces forming a wall about a centrally defined

electron beam path through the pole pieces and with microwave energy coupling holes located off axis of the electron beam path through each pole piece for electromagnetically coupling adjacent interaction cavities and means for producing a predetermined magnetic flux through said pole piece, the improvement therein in which the pole pieces comprise:

a pair of walls of a magnetic electrically conductive metal material having a predetermined thermal conductivity characteristic;

each of said walls containing a central cylindrical passage and a protruding lip surrounding said passage, said walls being oriented with said lip portions facing in opposite directions;

a washer-shaped metal member sandwiched in between said walls, and having a passage therein axially aligned with said passages of said walls to define an extended passage;

each of the portions of said walls sandwiching said member being of substantially equal thickness;

a hollow cylindrical metal member defining a cylindrical passage drift tube located within and joined to the walls of said extended passage;

said washer-shaped metal member and said hollow cylindrical member being of a nonmagnetic electrically conductive metal material having a thermal conductivity characteristic greater than said thermal conductivity characteristic of said walls,

said members being in a thermal conductive relationship with one another and with said walls,

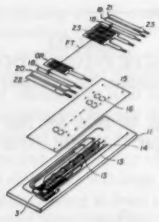
said walls being of sufficient thickness to jointly pass said predetermined flux without magnetically saturating.

4,103,208

FLUORESCENT TUBE DISPLAY CALCULATORS

Isamu Washizuka, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1976, Ser. No. 737,057
Claims priority, application Japan, Oct. 31, 1975, 50/131671
Int. Cl.[2] H05B *41/36*
U.S. Cl. 315—51 **6 Claims**



1. A fluorescent tube display calculator comprising:

an electrical insulator substrate;

segmented electrodes deposited on the insulator substrate, each of the segmented electrodes being coated with fluorescent material;

a plurality of grids deposited above the segmented electrodes;

a filament deposited above the grids; said segmented electrodes, said grids and said filament in combination constituting the fluorescent tube display;

an LSI semiconductor chip mounted on the insulator substrate;

a package deposited on the insulator substrate for surrounding the fluorescent tube display; and

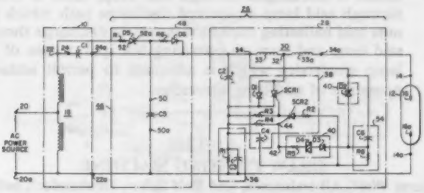
connections provided between the fluorescent tube display and the LSI semiconductor chip and deposited on the insulator substrate.

4,103,209

ADD-ON INSTANT RESTRIKE DEVICE FOR AN HID LAMP

Robert T. Elms, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1977, Ser. No. 800,662
Int. Cl.[2] H05B *41/04*
U.S. Cl. 315—207 **2 Claims**



1. In combination with a ballast for a high-intensity discharge lamp having two input terminals and two electrodes operatively disposed within the lamp, said ballast including a constant output voltage transformer having transformer input terminals and transformer output terminals, said transformer input terminals adapted to be connected to an AC power source, and a ballasting capacitor means having one terminal connected to one of said transformer output terminals and the other terminal of said ballasting capacitor means and the other of said transformer output terminals constituting the normal ballast output terminals across which the terminals of said high-intensity discharge lamp are normally adapted to be connected, the improvement which comprises an add-on instant restrike device for initiating an operating discharge in said lamp when it is still hot from previous operation, said restrike device comprising:

(a) high-voltage pulse-generating means connected across said normal ballast output terminals, said pulse-generating means comprising autotransformer means having a tap defining the primary and secondary thereof and said autotransformer means connected at its end portions in circuit between said other ballasting capacitor means terminal and one of said lamp input terminals, storage capacitor means connected in circuit across said normal ballast output terminals, gate-controlled solid-state switching means connected between said tap of said autotransformer means and said storage capacitor means to form a series loop comprising the primary of said autotransformer means and said storage capacitor means and said switching means, and first voltage responsive conduction means connected in circuit across said storage capacitor means and having an output connected to gate means of said solid-state switching means, and when said pulse-generating means is energized said storage capacitor means has applied thereacross an increasing potential which causes said first voltage responsive conduction means to conduct when a predetermined value of voltage is applied across said storage capacitor means which gates said switching means to discharge said storage capacitor means through said series loop to generate a short duration high-voltage pulse across said autotransformer means and create through said high-intensity discharge lamp an ionized discharged path;

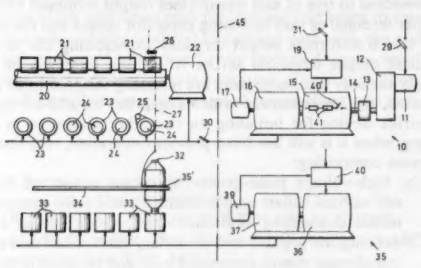
(b) intermediate voltage generating means which coacts with said ballasting capacitor means to charge said ballasting capacitor means to an intermediate voltage through a plurality of half cycles of energizing potential when said ballast is energized, said intermediate voltage generating means comprising charging means including a charging capacitor means having one terminal thereof in circuit with said one transformer output terminal and the other terminal thereof connected to said other transformer output terminal, second voltage responsive conduction means having an anode and a cathode, said anode of said second

voltage responsive conduction means connecting to said one transformer output terminal and said cathode of said second voltage responsive conduction means connecting to said one terminal of said charging capacitor means, whereby when said ballast is energized while said lamp is still hot, said storage capacitor means charges while said ballasting capacitor means simultaneously charges to an intermediate voltage, and when said storage capacitor means is discharged through said loop, there is created through said lamp an ionized discharge path which permits said ballasting capacitor means to discharge through said lamp and form an operating hot spot on one of said lamp electrodes which is adequate to permit sustained operation of said lamp thereafter.

4,103,210
DRAW TWISTING MACHINE

Horst Wolf, Albershausen, and Rolf Seher, Denkendorf, both of Fed. Rep. of Germany, assignors to Zinser-Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation of Ser. No. 409,010, Oct. 23, 1973, abandoned.
This application Oct. 21, 1975, Ser. No. 624,389
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1972, 2251843
Int. Cl.[2] H07K *17/34*
U.S. Cl. 318—46 **7 Claims**



1. In a draw twisting machine having an electrical drive means for simultaneously supplying power to a plurality of synchronous motors which drive fiber transport rollers of the draw twisting machine and which are to start, run and stop in synchronism, the electrical drive means including a variable frequency A.C. generator whose output frequency is proportional to the shaft speed of a driven shaft and a D.C. motor, whose speed can be steplessly varied, coupled to the driven shaft, the improvement comprising: auxiliary drive means including an electric motor of a type whose operational speed of rotation is substantially unaffected by changes in load.

4,103,211
DYNAMIC DRAG ARRANGEMENT FOR ELECTRICALLY PROPELLED TRACTION VEHICLES

Alvin Leonard Gardner, and Barry Jay Turley, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Jan. 26, 1977, Ser. No. 762,692
Int. Cl.[2] H02P *3/14*
U.S. Cl. 318—87 **12 Claims**

1. In a propulsion system for traction vehicles utilizing separately excited electric traction motor means, the improvement comprising:

a. at least one direct current electric traction motor having an armature and a field winding;

b. a first controllable electrical power source;

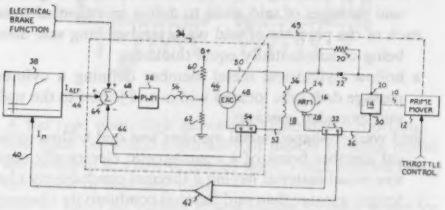
c. control means associated with said first source for increasing and decreasing the magnitude of its output voltage as desired;

d. conducting means for interconnecting said motor armature and said first source in a closed armature current circuit, said conducting means including means for introducing current limiting impedance means into said armature current circuit when the voltage of said first source is less than the CEMF of said armature;

e. means for providing a first signal representative of the magnitude and polarity of current through said motor armature;

f. function generator means for providing a field current reference signal having a predetermined minimum value and varying above said minimum value as a predetermined function of a signel applied to a signal input terminal thereof;

g. means for coupling said first signal to said signal input terminal of said function generator;



h. a second controllable electrical power source for providing a variable output excitation at output terminals thereof in response to a signal applied to a signal input terminal thereof;

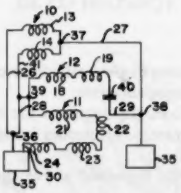
i. means for coupling said field current reference signal to said signal input terminal of said second source; and

j. means for interconnecting said output terminals of said second source to said motor field winding whereby the magnitude of current in said motor field winding is controlled in response to said current reference signal and said predetermined minimum value of said current reference signal results in a level of motor torque that effects a dynamic drag on said vehicle when decelerating in response to a decrease in the magnitude of the output voltage of said first source.

4,103,212
TWO SPEED SINGLE PHASE INDUCTION MOTOR

Gene V. Spradling, Glendale, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 16, 1976, Ser. No. 723,990
Int. Cl.[2] H02K *17/08*
U.S. Cl. 318—224 A **10 Claims**



1. An induction motor, comprising:

a rotor assembly;

a stator assembly including a core of magnetic material formed from a stack of individual laminations, said core having a central, bore opening in it adapted to receive slots formed in said core, and windings in said slots, said windings including:

a single main winding defining a first physical motor pole and a second physical motor pole;

a first auxiliary winding defining a first physical and electrical motor pole and a second physical and electrical motor pole, said first and said second physical motor poles of said first auxiliary winding being rotated physically with respect to the first and second physical poles of said first main winding;

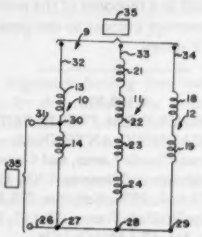
a second auxiliary winding having twice the number of physical and electrical motor poles as said main winding; and

means for operatively interconnecting respective ones of said first and said second auxiliary windings with said main winding, said interconnecting means including switch means for electrically connecting said entire main winding and said second auxiliary winding such that the polarity of said main winding produces two consequent physical poles resulting in four electrical poles.

4,103,213
TWO SPEED SINGLE PHASE INDUCTION MOTOR

Robert A. Landgraf, Ferguson, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 16, 1976, Ser. No. 723,989
Int. Cl.[2] H02K *17/08*
U.S. Cl. 318—224 A **10 Claims**



1. A dynamoelectric machine, comprising:

a rotor assembly;

a stator assembly including a core constructed from a stack of individual laminations of magnetic material, said laminations having a central opening which defines a rotor receiving bore opening in the stacked relationship of the laminations, said laminations also having a plurality of closed bottom receptacles formed in them, said receptacles opening onto said bore and defining winding receiving slots in the stacked relationship of the laminations, and windings in said slots, said windings comprising:

a first main winding having at least a first physical motor pole and a second physical motor pole;

a second main winding having at least first, second, third and fourth physical motor poles;

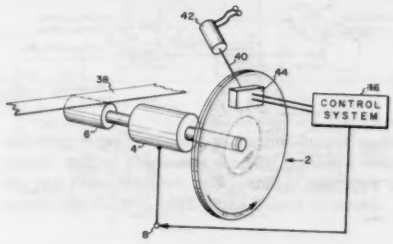
an auxiliary winding, said auxiliary winding having a first physical motor pole and a second physical motor pole, said auxiliary winding being physically displaced with respect to said first main winding; and

means for operatively interconnecting selective ones of said first main winding, said auxiliary winding and said second main winding to give two-speed motor operation, said interconnecting means electrically connecting said first main winding and said auxiliary winding to provide a first motor speed capability, said interconnecting means connecting said first main winding and said second main winding so that said first main winding acts as an auxiliary winding for said second main winding to give a second motor speed capability, the polarity of said first main winding in said second speed capability condition being chosen so as to form two consequent physical poles producing four electrical motor poles.

4,103,214
ERROR CANCELLING SYNC-OFF-TACH TAPE DRIVE SYSTEM

Michael F. Braitberg, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 12, 1975, Ser. No. 557,792
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—326 **13 Claims**



1. A tape drive control system comprising:

a drive motor means,

a tape drive capstan arranged to be driven by said motor means,

tone wheel means arranged to be driven by said motor means, said tone wheel means having a holographic recording of successive holograms thereon,

hologram reading means arranged to detect the successive holograms on said tone wheel means to produce a representative output signal, and

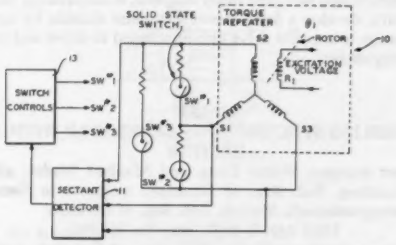
control means connected to said motor means and being responsive to said output signal to produce a control signal for controlling the speed of said motor means.

4,103,215
TORQUE REPEATER SELF-DRIVER

Bob Nicholas Naydan, Wyckoff, and Arnold Joseph Brand, Parsippany, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 22, 1976, Ser. No. 743,733
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—654 **5 Claims**

TORQUE REPEATER BLOCK DIAGRAM



1. A torque repeater system comprising:

a synchro converter having three stator windings,

said synchro having inherent rotor sectant positions of 60° when discrete stator windings are short-circuited,

switching means comprising three electronic switching circuits connected across said stator windings,

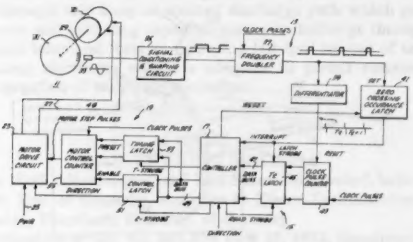
a programmable switch control connected to said switching means, and

a sectant detector connected to said switching means said stator windings and said programmable switch control said detector sensing the sectant of the angle of rotation of said synchro converter.

4,103,216
STEPPING MOTOR CLOSED LOOP CONSTANT VELOCITY CONTROL SYSTEM

Carlos F. Hayes, Redmond, Wash., assignor to Tally Corporation, Kent, Wash.

Filed May 28, 1976, Ser. No. 690,900
Int. Cl.[2] G05B 19/40
U.S. Cl. 318—685 12 Claims



1. A stepping motor closed loop constant velocity control system comprising:

(A) a time measuring means, suitable for connection to a stepping motor, for producing measured time data (T_t) related to the elapsed time occurring between step increments of movement of the shaft of said stepping motor;

(B) a controller including a memory for storing nominal time data (T_{nom}) and time delay data (D_{t-1}) produced as a result of an immediately preceding step increment of movement of said shaft, said controller connected to said time measuring means for receiving said measured time data (T_t), said controller suitable for developing new time delay data (D_t) for each step increment of movement of said shaft of said stepping motor by:

(1) comparing said measured time data (T_t) with said nominal time data (T_{nom}) so as to obtain velocity error data;

(2) summing the time delay data (D_{t-1}) produced as a result of an immediately preceding step increment of movement of said shaft with said velocity error data to produce new time delay data (D_t); and,

(3) storing said new time delay data for subsequent use as the time delay data of an immediately preceding step increment of movement of said shaft; and,

(C) an output subsystem connected to said controller to receive said new time delay data and, in accordance therewith, develop a delay motor step pulse suitable for application to a motor drive circuit adapted to drive said stepping motor.

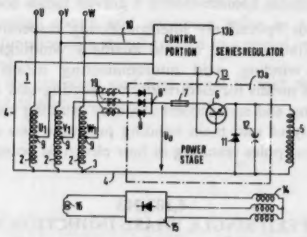
4,103,217
BRUSHLESS SYNCHRONOUS GENERATOR WITH AN EXCITER

Herbert Auinger; Walter Lang, and Manfred Mader, all of Nüremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,842
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615117
Int. Cl.[2] H02H 3/20
U.S. Cl. 322—28 8 Claims

1. In a brushless synchronous generator, with an exciter, the synchronous generator have three phase armature windings in its stator and a rotating field winding which is fed through a rectifier circuit by the co-rotating armature winding of the exciter, the outputs of the stator windings of the generator being coupled through a rectifier and series regulator having a control element to the stationary field winding of the exciter, the series regulator regulating the generator so as to maintain a constant output voltage, a bypass diode being shunted across the field winding of the exciter, an improved arrangement for protecting consumers of the output of the synchronous generator against over-voltages occurring because of a defective regulator comprising:

(a) an overvoltage arrester for shorting the exciter field winding shunted in parallel across the exciter field winding and in parallel with the bypass diode, said overvoltage arrester having a response voltage causing it to respond if the operationally permissible overvoltage is exceeded; and

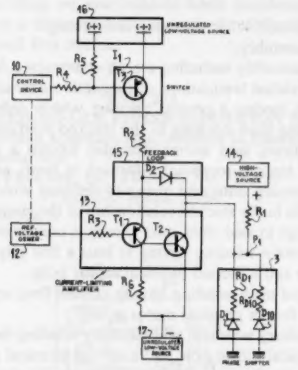


(b) a protective device in the regulator circuit, whereby when said permissible overvoltage is exceeded said overvoltage regulator arrester responds shorting the field winding it causes a short circuit current to flow in the regulator to result in a response of the protective device to permanently interrupt current to the generator excitation circuit to shut it down.

4,103,218
PHASE-SHIFTING SYSTEM FOR ELECTRONICALLY SCANNING ANTENNAS

Michel Chevalier; Jean-Claude Lucas, and Gerard Lacoste, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 5, 1976, Ser. No. 729,800
Claims priority, application France, Oct. 7, 1975, 75 30694
Int. Cl.[2] H01Q 3/26
U.S. Cl. 323—1 6 Claims



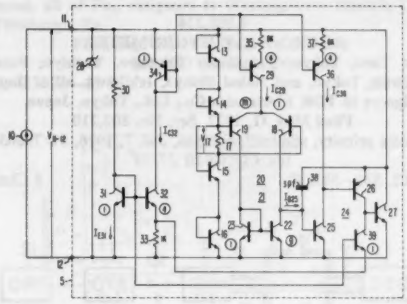
1. In a system for controlling a set of phase shifters associated with respective radiators of an electronically scanning antenna, each phase shifter including at least one phase-shifting diode connected through a series resistor to a source of back-biasing voltage normally blocking conduction therethrough, there being further provided an amplifier individual to each phase shifter with an input stage connected to a signal-responsive energizing circuit and an output stage connected to said source of back-biasing voltage through said series resistor whereby said phase-shifting diode is rendered conductive upon conduction of said output stage, the improvement wherein said amplifier is provided with a negative-feedback loop between said stages including a further diode poled to stabilize the

current drawn through said phase-shifting diode upon conduction of said output stage.

4,103,219
SHUNT VOLTAGE REGULATOR

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,765
Int. Cl.² G05F *1/60*
U.S. Cl. 323—8 **16 Claims**



1. In a shunt regulator having first and second terminals linked by means for determining the potential appearing between them, improved said means for determining the potential appearing between said first and second terminals, including:

a transistor having first and second electrodes and a controlled conduction path therebetween and having a third electrode, the conduction of said controlled conduction path being controlled responsive to potential appearing between the first and third electrodes;

a resistance having first and second ends;

first direct current conductive means connecting the first electrode of said transistor to said first terminal;

second direct current conductive means connecting the second electrode of said transistor to the first end of said resistance;

third direct current conductive means connecting the second end of said resistance to said second terminal;

means providing direct coupling between the second end of said resistance and the third electrode of said transistor; and

means responsive to potential drop appearing across said resistance for shunt regulating the current flow through said means for determining the potential appearing between said first and second terminals.

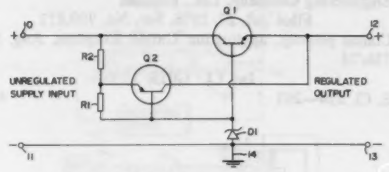
4,103,220
LOW DISSIPATION VOLTAGE REGULATOR

Christopher Ryland Huntley, Burnaby, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Apr. 4, 1977, Ser. No. 784,552
Int. Cl.² G05F *3/08*
U.S. Cl. 323—19 **2 Claims**

1. A DC voltage regulator having first and second input terminals and first and second output terminals, the second input terminal and second output terminal being in common, and the output terminals having developed therebetween a constant direct output voltage unaffected by variations in direct input voltage applied between the input terminals, said regulator comprising:

a first transistor having a base, emitter and collector, the collector of the first transistor being connected to the first output terminal; a first resistor connected between the base-emitter of the first transistor; a second transistor having a base, emitter, and collector, the collector of the second transistor being connected to the first input terminal, the base of the first transistor being connnected to the base of the second transistor and the emitter of the second

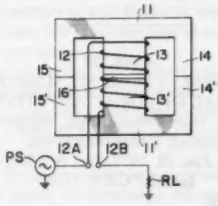


transistor being connected to the first output terminal; a second resistor connecting the first transistor emitter to the first input terminal; and a voltage reference device connecting the two bases to the second terminals.

4,103,221
INDUCTOR WITH PLURALITY OF MAGNET PIECES IN AIR GAP

Masahiko Fukui, Kumagaya; Hiromi Sako, Fukaya, and Masao Ogata, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 471,157, May 17, 1974, Pat. No. 3,968,465. This application Apr. 26, 1976, Ser. No. 680,539
Claims priority, application Japan, May 18, 1973, 48/54624; Jul. 23, 1973, 48/80924; Jul. 23, 1973, 48/80925; Jul. 20, 1973, 48/80588; Jan. 30, 1974, 49/12060; Feb. 22, 1974, 49/20817
Int. Cl.² G05F *1/22;* H01F *21/00*
U.S. Cl. 323—92 **5 Claims**



5. An inductor device comprising:

a magnetic circuit comprising a first iron core made of soft magnetic material having at least two legs, and a second iron core made of soft magnetic material having at least two legs, said legs of said second iron core having end faces which oppose end faces of the legs of said first iron core, and at least one air gap formed between the end faces of the first and the second iron cores;

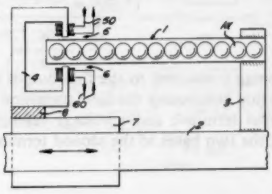
coil means wound around a portion of said magnetic circuit having terminals connected in series with a power source and a load; and

a plurality of rare earth-cobalt magnet pieces insulated one from the other, disposed in said at least one air gap between said end faces, said permanent magnet pieces being substantially disposed in a common plane.

4,103,222
PHASE DISPLACED MEASUREMENT OF CONTIGUOUS SPHERICAL BALLS

James Hugh Phillips; Curt Ludwig David, and Michael James Rogers, all of Peterborough, England, assignors to The Newall Engineering Company, Ltd., England

Filed Jul. 27, 1976, Ser. No. 709,072
Claims priority, application United Kingdom, Aug. 5, 1975, 32724/75
Int. Cl.[2] G01R 33/00
U.S. Cl. 324—207 4 Claims

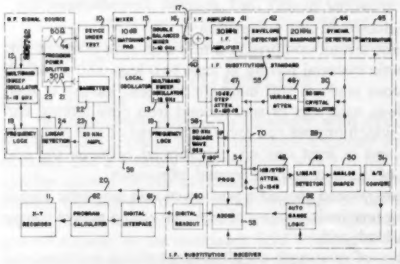


1. A position detector comprising a first member, a plurality of identical steel balls housed in a longitudinal row on the first member and disposed in a linear array in side by side point contact and constrained against movement relative to one another, a second member, a transducer carried by said second member, said first and second members being relatively movable in a rectilinear path parallel to the longitudinal row of balls with said members being capable of relative displacement in a direction parallel to the line of point contact of the balls, said transducer comprising means positioned on one side of the balls for producing a periodically varying magnetic field through the balls in a direction extending across the row thereof and perpendicular to the longitudinal line of contact of the balls, and separate means positioned on the other side of said balls for sensing phase-displaced variations produced in the magnetic field by said relative movement of the members and for producing signals denoting the relative positions of the first and second members, said sensing means comprising at least two pick-up coils coupled by mutual inductance only with the signal producing transducer and disposed adjacent to and spaced apart along the row of balls and along the line of contact thereof.

4,103,223
CLOSED LOOP FOR AUTOMATIC SUBSTITUTION OF A SIGNAL OF EQUAL AMPLITUDE

Fritz K. Weinert, Gaithersburg, Md., assignor to Weinschel Engineering Company, Gaithersburg, Md.

Filed Jun. 21, 1977, Ser. No. 808,742
Int. Cl.[2] G01R 27/00
U.S. Cl. 324—57 R 26 Claims



12. Apparatus for automatically substituting the amplitude of an I.F. signal comprising:

a signal source for producing said substitution at said I.F. frequency signal,

closed loop means, including attenuator means for receiving the output of said substitution signal source and for controlling the amplitude of said substitution signal,

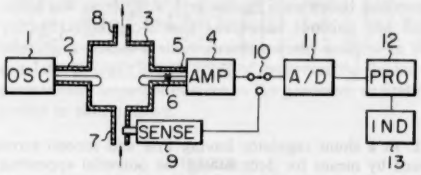
a branch attenuating system connected to said closed loop and for measuring the amplitude of said substitution signal at one point in said closed loop,

said branch attenuating system including control means for controlling the attenuation of at least a part of said attenuator means.

4,103,224
MICRO-WAVE HYGROMETER

Miura Taro, Tokyo; Yamamoto Takahiro, Yachiyo; Suzuki Makoto, Tokyo, and Nakai Shinya, Ichikawa, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 802,210
Claims priority, application Japan, Jul. 7, 1976, 51/79863
Int. Cl.[2] G01R 27/04
U.S. Cl. 324—58.5 C 6 Claims

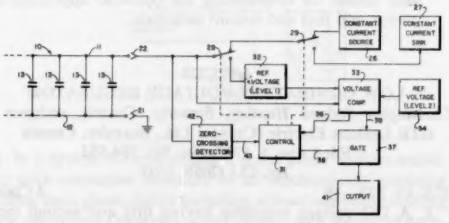


1. A micro-wave hygrometer comprising a shield housing having a small hole for the flow of the air but preventing the radiation of the micro-wave energy, a dielectric resonator mounted in the housing, a support for supporting said dielectric resonator in said housing at the portion where the electric field is weak, a pair of antennae provided in said housing for transmitting and receiving the micro-wave energy through said dielectric resonator.

4,103,225
SYSTEM AND METHOD FOR DETERMINING CAPACITANCE AND CABLE LENGTH IN THE PRESENCE OF OTHER CIRCUIT ELEMENTS

Berton H. Stephens, Los Altos, Calif., assignor to Dynatel Corporation, Sunnyvale, Calif.

Filed Jan. 5, 1977, Ser. No. 757,030
Int. Cl.[2] G01R 27/26, 31/08
U.S. Cl. 324—60 CD 12 Claims



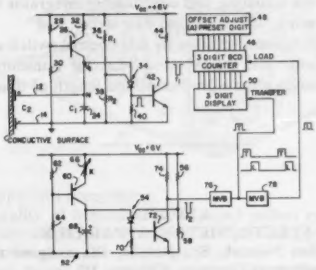
11. In apparatus for determining the capacitance of an electrical element: means for applying a charging current of constant magnitude to the element to increase the voltage across the same from a first predetermined level to a second predetermined level, a constant current load, means for connecting the load to the element to effect a constant current discharge of the element to decrease the voltage from the second level to the first level, means for monitoring the level of the voltage across

the element, and means for delivering an output signal corresponding to the time required to increase the voltage from the first level to the second level and to return the voltage back to the first level, said output signal being proportional to the capacitance of the element.

4,103,226
APPARATUS FOR GAUGING THE TEXTURE OF A CONDUCTING SURFACE

Robert E. Fromson, Wilkins Township, Allegheny County; James N. Brecker, Mt. Lebanon, and Lanson Y. Shum, Delmont, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1976, Ser. No. 723,269
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **20 Claims**



1. Apparatus for gauging the texture of a conductive surface comprising:

(a) capacitance means arranged in spaced relationship to an incremental area of said conductive surface and forming with said conductive surface a variable capacitance when said means is in spaced insulated relationship thereto for gauging the texture of said conductive surface;

(b) means for energizing said capacitance means;

(c) means coupled to said energizing means for providing a datum potential;

(d) means coupled with said capacitance means and said datum potential means, for deriving a discharge pulse each time said datum potential is exceeded by the charge on said capacitance means; and

(e) means coupled with said deriving means for counting said pulses over a time period, with the summed number of pulses received during said time period being a function of the texture of said incremental area.

14. Apparatus for gauging a predetermined characteristic of a conductive surface, said apparatus comprising

capacitance means including a conductive plate member arranged in a spaced relationship with an incremental area of said surface and capacitivety coupled to said surface, which incremental area is determined by said plate member and provides a variable capacitance as determined by said surface characteristic for gauging said characteristic of the surface, and

dielectric means resting on said surface and positioned between said plate member and said surface for determining said spaced relationship.

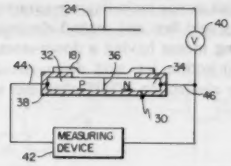
4,103,227
ION-CONTROLLED DIODE

Jay N. Zemel, Jenkintown, Pa., assignor to University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 25, 1977, Ser. No. 781,474
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 R **12 Claims**

1. An ion sensor for sensing the presence and/or concentration of an ion in a fluid, said sensor comprising:

an insulated semiconductor diode having a P/N junction; and

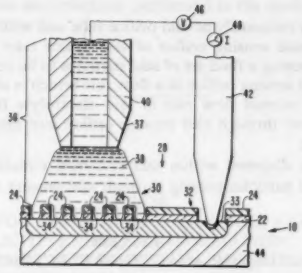


an ion-sensitive membrane, separating said junction from said fluid and juxtaposed with said junction.

4,103,228
METHOD FOR DETERMINING WHETHER HOLES IN DIELECTRIC LAYERS ARE OPENED

William Edward Ham, Mercerville, N.J., assignor to RCA Corp., New York, N.Y.

Filed May 16, 1977, Ser. No. 797,401
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 R **7 Claims**



1. A method of determining whether holes formed in a dielectric layer on a surface of a semiconductor wafer are open to communicate with said surface comprising the steps of:

(a) selecting a portion of said dielectric layer for a test area;

(b) forming at least one specimen hole in said dielectric layer within said test area;

(c) electrically contacting said wafer through said specimen hole with an electrolytic input probe;

(d) electrically contacting said wafer with an output probe;

(e) applying a voltage between said input probe and said output probe; and

(f) measuring the current flow between said input probe and said output probe to determine whether any dielectric remains between said input probe and said surface.

4,103,229
CONTINUOUS-FLOW, RESISTIVE-PARTICLE COUNTING APPARATUS

Adrian R. L. Gear, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Jan. 28, 1977, Ser. No. 763,630
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—71 CP **4 Claims**

1. Continuous-flow resistive-particle counting apparatus comprising:

container means for housing a bulk electrolyte;

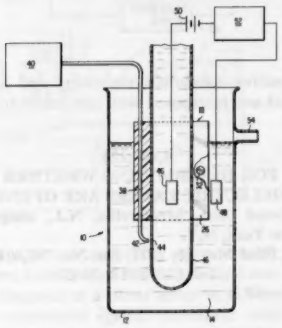
an orifice tube closed at the lower end thereof and having a sensing orifice defined within a side wall portion thereof, a portion of said electrolyte thereby being disposed within said tube;

a first electrode disposed within said electrolyte disposed within said orifice tube;

a second electrode disposed within said bulk electrolyte disposed within said container;

electric circuit means including a power source, electrically connecting said first and second electrodes;

fluid pumping means having a down-stream tube equipped with an injection jet, said down-stream tube disposed within the electrolyte in said container at a position radially outwardly of said orifice tube and within the vicinity of said sensing orifice of said orifice tube for forcefully injecting a fluid jet of said particles to be counted toward said sensing orifice at a flow rate which is at least ten-fold the normal flow rate of said electrolyte from said container through said sensing orifice into said orifice tube; and



means disposed within said electrical circuit for counting said particles passing through said sensing orifice.

4,103,230

APPARATUS FOR ANALYZING ELECTRICAL SIGNALS OF VARIABLE AMPLITUDE

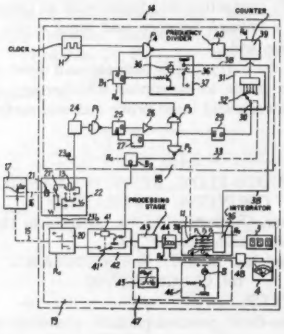
Robert Dubernet, Chatillon; Lucien Janvier, Monthlhery; Roger Tirilly, Verrieres-Le-Buisson, and Patrick O'Connolly, Clamart, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 8, 1976, Ser. No. 703,375

Claims priority, application France, Jul. 8, 1975, 75.21355

Int. Cl.[2] G01R *23/16*

U.S. Cl. 324—77 H **11 Claims**



1. Apparatus for analyzing at least one electrical signal of variable amplitude, comprising:

a processing assembly for receiving an electrical signal, said processing assembly (including) comprising:

(a) a rectifier for rectifying the signal;

(b) means for maintaining the peak voltage of the rectified signal;

(c) a controllable integrator electrically connected to the output of said rectifier for integrating the rectified signal; and

(d) a controllable switch for checking the admission of the signal into said rectifier;

a first display element for displaying said peak voltage;

a second display element for displaying the integrated signal output of said integrator;

a control switch arrangement; and a logic assembly for controlling said processing assembly comprising:

(a) first means actuable by said control switch arrangement for switching said controllable switch of said processing assembly after a first time delay for admitting the signal to said rectifier;

(b) second means actuable by said control switch arrangement for actuating said controllable integrator to begin integrating, after a second time delay; and

(c) counter means actuable by said control switch arrangement after said second time delay for transmitting the integration after a predetermined length of time.

4,103,231

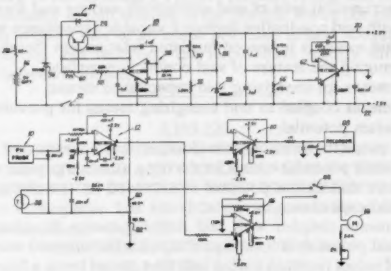
ELECTROMETRIC APPARATUS

Donald Stephen Nemcek, Sr., Roselle, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Apr. 29, 1977, Ser. No. 792,270

Int. Cl.[2] G01R *1/30*

U.S. Cl. 324—123 R **4 Claims**



1. Electrometric apparatus comprising a measuring device for providing a high impedance dc signal which varies in accordance with the variable to be measured, at least one amplifier means for amplifying said high impedance dc signal, indicating means connected to said amplifier means for indicating the amplitude of said amplified dc signal, a transistor radio battery, and regulating means having a low quiescent current connecting said battery to the supply terminals of said amplifier means for regulating the current supplied to said amplifier means, said regulating means including a transistor having its emitter-collector circuit connected in series with said battery and the supply terminals of said amplifier means, a resistor connected by one end to one of said supply terminals, a low current type Zener diode connected by one end to the other end of said resistor and by its other end to the other supply terminal of said amplifier means, a pair of series connected resistors shunt connected between said supply terminals, a programmable operational amplifier having one input connected to the junction between said resistor and said Zener diode and the other input connected to the junction between said series connected resistors, the output of said operational amplifier being connected to the base of said transistor.

4,103,232
WAFER TRANSFER DEVICE

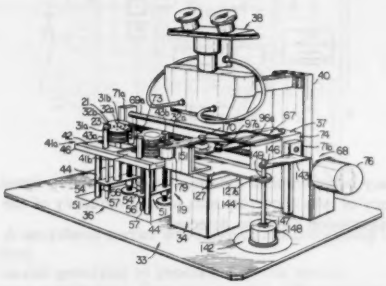
Kazuhiro Sugita, and Chiyohide Kon, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,020

Claims priority, application Japan, Dec. 28, 1974, 50-3370; Dec. 29, 1974, 50-2140; Dec. 28, 1974, 50-3368; Dec. 28, 1974, 50-3369; Dec. 28, 1974, 50-3574

Int. Cl.[2] G01R *31/22;* B65G *47/24*

U.S. Cl. 324—158 F **10 Claims**



2. Apparatus comprising:

a plurality of individual disc-shaped pallets each having a wafer-shaped article secured at a precisely predetermined position on a face of the pallet;

storage means for supporting said pallets in first and second stacks;

holding means for holding one of said disc-shaped pallets at opposed portions of the edge thereof, said holding means including a pair of arms movable relative to each other with one of said arms determining a precise position of the held pallet relative to said holding means and the other of said arms moving to effect the gripping and releasing of a pallet;

pallet support means at a testing station spaced from said stacks;

driving means for moving said holding means so as to pick-up the uppermost of said pallets from said first stack and transport the same to a precisely predetermined position on said pallet support means and, thereafter, to pick up the pallet from said support means and transport the same to the top of said second stack; and

a measuring device at said testing station for measuring the wafer-shaped article on a pallet at said precisely predetermined position on said support means.

4,103,233
INSTALLATION FOR THE MEASURING OF AN ESSENTIALLY LINEAR DISPLACEMENT

Armand Timmermans; Eduard Selleslagh, both of Haasdonk, and José N. E. Deneyer, Petit-Enghien, all of Belgium, assignors to Verenigde Energiebedrijven van het Scheldeland, Antwerp, Belgium

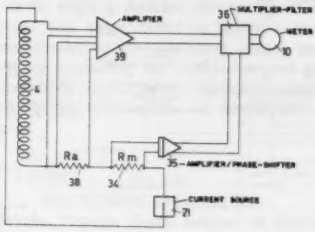
Filed Aug. 12, 1976, Ser. No. 713,835

Claims priority, application Belgium, Aug. 13, 1975, 159166; Jul. 10, 1976, 169417

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—208 **22 Claims**

1. Installation for the measuring of an essentially linear displacement of a body, with a fixed coil the axial direction of which corresponds to the direction of the displacement to be measured, a rod the magnetic permeability of which differs from the magnetic permeability of the medium which is surrounded by the coil, means for connecting said rod along the axis of the coil to that body the displacement of which should be measured, an A.C. source with constant amplitude and pulsation (angular frequency) causing a voltage drop in the coil, means electrically connected to the coil and generating a voltage signal dependent of and in phase with the voltage drop in the coil, means electrically connected in series with the AC current source, generating a signal proportional to and in phase with the current through the coil, means for phase shifting by 90° one of said signals, which means are electrically connected



to the means which generates the signal, a device which operates as a multiplier for multiplying the phase-shifted signal and the other signal which device is electrically connected to the means for phase shifting and to the means for generating the non-shifted signal and a meter electrically connected to the device which operates as a multiplier measuring the signal obtained by the multiplication performed in the device.

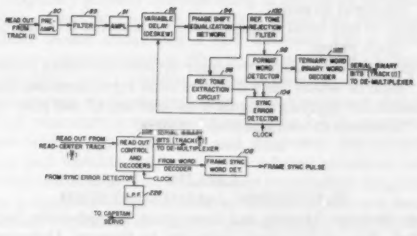
4,103,234
SYSTEM FOR TRANSMISSION STORAGE AND/OR MULTIPLEXING OF INFORMATION

William R. Frazier, Jr., Indialantic, Fla., assignor to General Dynamics Corp., St. Louis, Mo.

Division of Ser. No. 685,353, Nov. 24, 1967, Pat. No. 3,588,836. This application Feb. 2, 1971, Ser. No. 111,919

Int. Cl.[2] H04B *1/00*

U.S. Cl. 325—38 A **19 Claims**



1. The method of processing digital information for high density data transmission via an information carrying medium which comprises the steps of translating said information into a series of successive data words each having a given number of binary bits, and successively encoding each of said data words into a format word selected from an alphabet of format words, each having a series of signals equal in number to said given number and having zero average amplitude,

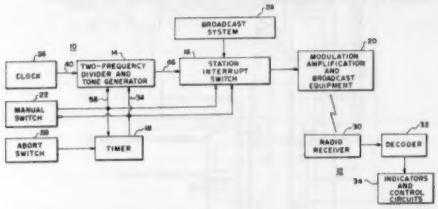
controlling the reception of said format words from said medium in accordance with their zero average amplitude characteristic that each of said words is segregated, and

retranslating said format words into data words corresponding thereto.

4,103,235
TWO-TONE ATTENTION SIGNAL BROADCASTING SYSTEM

Patrick Doyle Bryant, 2310 Garfield, Apt. 5, Lincoln, Nebr. 68502

Filed Aug. 4, 1976, Ser. No. 711,486
Int. Cl.[2] H04H 9/00
U.S. Cl. 325—64 **19 Claims**



1. A signaling system for broadcast by broadcast equipment on carrier frequencies normally used for other broadcasts comprising:

an encoder;

a timer;

a source of audio signals for broadcasting at a carrier frequency;

an interrupt switch means for electrically operatively connecting said source of audio signals to said broadcast equipment for transmission at one time and for electrically operatively connecting said encoder to said broadcast equipment at other times;

said encoder including means for generating digital signals at two predetermined frequencies, converting said digital signals to sine waves and combining said sine waves for application to said interrupt switch;

said timer including means for switching said interrupt switch means from said encoder back to said source of said audio signals a predetermined time after said interrupt switch means has been switched from audio signals to said encoder; and

switch means for actuating said interrupt switch means to connect said encoder to said broadcast equipment and for starting said timer;

said encoder including a source of clock pulses, a first frequency divider, and a second frequency divider;

said first and second frequency dividers each having a different input terminal;

each of said input terminals being connected to a source of clock pulses;

said first and second frequency dividers including counters each of which has a different reset input terminal; and

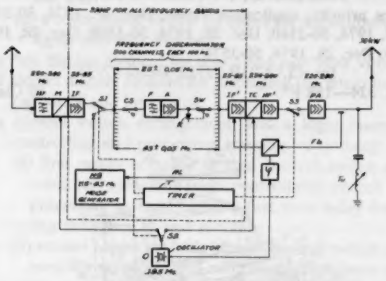
means for applying a signal to at least one of said reset input terminals to energize said counters.

4,103,236
ELECTRONIC JAMMING SYSTEM

Peter Deserno, Munich, and Hans Prost, Munich-Solln, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1961, Ser. No. 154,913
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1960, 70474
Int. Cl.[2] H04K 3/00
U.S. Cl. 325—132 **16 Claims**

1. A method of jamming wireless communications having a frequency falling within a predetermined frequency band, by means of a powerful jamming transmission, comprising the steps of separating out from the predetermined frequency band, by an electrical filtering operation, a suspect transmission signal falling therein, producing an interference signal band having a band width sufficient to include all filtered frequencies, separating out, by an electrical filtering operation, a signal having a frequency corresponding to the frequency of the previously filtered suspect signal, from said interference signal band, and utilizing said last filtered signal at the interference

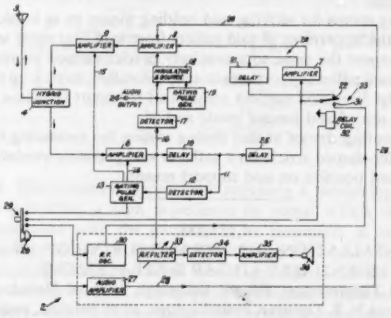


frequency in the wireless transmission of a jamming signal, the frequency of which corresponds to the frequency of the suspect transmission signal so detected.

4,103,237
RADIO JAMMING SYSTEM

Laurin G. Fischer, Glen Rock, N.J., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Dec. 15, 1955, Ser. No. 553,352
Int. Cl.[2] H04K 3/00
U.S. Cl. 325—132 **7 Claims**

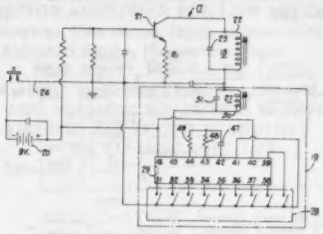


1. A repeater comprising an antenna system, a repeater loop consisting solely of broadband elements for coupling the input signal from the input to the output thereof without changing the frequency of the signal at any place in the loop, said elements including at least one broadband translation device, means coupling the input and output of said repeater loop to said antenna system to receive incoming signals and for retransmitting said signals, and means for communicating through said repeater including a source of local intelligence signals, a source of a local carrier wave, means coupling said wave source to said loop at a point ahead of said translation device and means coupling the source of local intelligence signals to said translation device to modulate said local carrier wave.

4,103,238
TRANSMITTER MODULATED WITH THREE MODULATION PATTERNS

Andrew F. Deming, Alliance, Ohio, and James B. Russell, Glenshaw, Pa., assignors to The Alliance Manufacturing Company, Alliance, Ohio

Filed Nov. 26, 1976, Ser. No. 744,976
Int. Cl.² H04B 1/04
U.S. Cl. 325—141 **23 Claims**

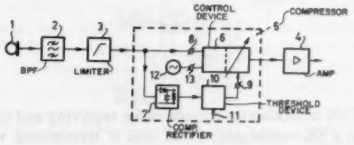


1. A modulated carrier wave transmitter comprising in combination;
a carrier generator to generate a carrier wave;
means establishing first and second different modulation frequencies;
means establishing time sequential control signals;
modulation means connected to modulate said carrier wave by said first and second modulation frequencies in first, second and third modulation patterns, comprising;
first means connected to modulate said carrier wave with said first modulation frequency in accordance with said sequential control signals to establish said first modulation pattern of said carrier wave for at least one bit period, a bit period being the time period required for the transmission of one complete interval of the first, second or third modulation pattern,
second means connected to modulate said carrier wave with said second modulation frequency in accordance with said sequential control signals to establish said second modulation pattern of said carrier wave for at least one bit period,
and third means connected to modulate said carrier wave with said first modulation frequency and sequentially with said second modulation frequency in accordance with said sequential control signals to establish said third modulation pattern of said carrier wave for at least one bit period, the signal being transmitted containing all three modulation patterns.

4,103,239
COMPRESSOR FOR BOTH SPEECH AND CARRIER SIGNALS

Willem Douwe Meewezen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 616,628, Sep. 25, 1975, abandoned. This application May 2, 1977, Ser. No. 792,647
Claims priority, application Netherlands, Oct. 1, 1974, 7412916
Int. Cl.² H04B 1/04
U.S. Cl. 325—144 **5 Claims**

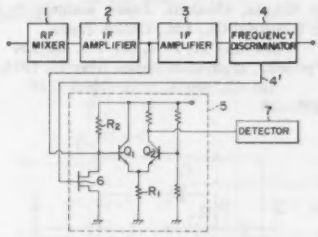


1. A transmitter comprising a dynamic compressor having a dynamic control device and a compression rectifier fed by the signals to be transmitted, a threshold device coupled between said rectifier and said control device, a carrier signal source which supplies a pilot signal, the signal to be transmitted and the pilot signal being supplied to the dynamic control device, the dynamic control device comprising an input circuit including an amplitude modulator coupled to said signal source, the signal to be transmitted being applied to said modulator for generating at an angle a double-sideband signal with suppressed carrier, said input circuit including a combination device means coupled to the modulator output and to said signal source for combining the double-sideband modulated signal said control device further comprises amplitude control means coupled to said combination and threshold devices and the pilot signal.

4,103,240
FM TUNING INDICATOR

Nobuyuki Sakabe, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Nagoya, Japan

Continuation of Ser. No. 661,504, Feb. 26, 1976, abandoned. This application Aug. 2, 1977, Ser. No. 821,075
Claims priority, application Japan, Jun. 17, 1975, 50-73337
Int. Cl.² H04B 1/16
U.S. Cl. 325—349 **5 Claims**



1. An FM tuner including means for producing an intermediate frequency signal; frequency discriminator means with "S" characteristics for frequency-discriminating said intermediate frequency signal; differential amplifier means responsive to a substantially rectilinear portion of said "S" characteristics to produce an output signal whose amplitude becomes maximum at a frequency position corresponding to the center frequency position of said intermediate frequency signal, said differential amplifier means comprising a first transistor and a second transistor connected to each other so as to constitute a differential amplifier, and a variable resistance element connected to said frequency discriminator means in such a manner that the internal resistance is variable depending on a d.c. component output which is provided by said frequency discriminator means, said variable resistance element being associated with said differential amplifier, wherein said intermediate frequency signal is imparted to the base of said first transistor; and detector means responsive to said out-put signal provided by said differential amplifier means to produce an indication as to whether said tuner is in a tuned state or not.

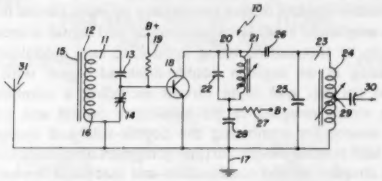
4,103,241
RF AMPLIFIER AND ANTENNA

Jack Najork, Lexington, Nebr., assignor to Reach Electronics, Inc., Lexington, Nebr.

Filed Aug. 11, 1975, Ser. No. 603,350
Int. Cl.² H04B 1/18
U.S. Cl. 325—373 **3 Claims**

1. In a receiver for RF signals, the combination comprising an RF amplifier for amplifying RF signals and having a point of ground reference potential, an internal antenna adapted to receive RF signals and having an output on which such RF

signals appear, said output being coupled to said RF amplifier, and means defining an input for RF signals from an external antenna, said means being connected to said ground reference



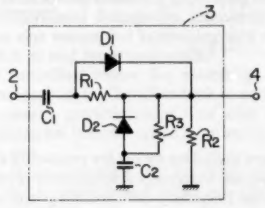
potential, said internal antenna being tunable and having been tuned while said input means is connected to said ground reference potential to maximize the sensitivity of said receiver.

4,103,242

WAVEFORM CONVERTER FOR ALTERING THE FREQUENCY SPECTRUM OF AN OUTPUT SIGNAL

Junnosuke Shigeta, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1976, Ser. No. 685,134
Claims priority, application Japan, May 15, 1975, 50-58015
Int. Cl.[2] H03K *5/08*; G06G *7/18*
U.S. Cl. 328—35 **4 Claims**



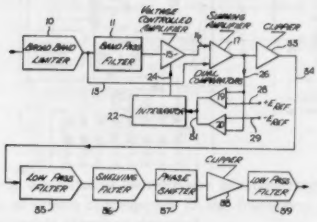
1. A waveform converter comprising:
an input terminal, an output terminal and a ground,
a first capacitor having one end connected to said input terminal and the other end connected to one end of a first resistor, the other end of said first resistor being connected to said output terminal,
a first switching device connected between said one end of said first resistor and said output terminal,
a second resistor connected between said output terminal and said ground,
a second switching device connected in parallel with a third resistor, one end of said parallel connection being connected to said output terminal,
a second capacitor connected between the other end of said parallel connection and ground,
one of said first and second switching devices being rendered conductive and the other being rendered non-conductive in response to a change of a square wave signal applied to said input terminal from a first to a second potential and said other of said switching devices being rendered conductive and said one of said switching devices being rendered non-conductive in response to a change of said square wave input signal from said second to said first potential, whereby said first capacitor and said second resistor substantially constitutes a differentiating circuit and said first resistor and said seacond capacitor substantially constitutes an integration circuit.

4,103,243

METHOD AND SYSTEM FOR CONTROLLING PEAK SIGNAL LEVELS IN A BANDLIMITED RECORDING OR TRANSMISSION SYSTEM EMPLOYING HIGH-FREQUENCY PRE-EMPHASIS

Robert A. Orban, Menlo Park, Calif., assignor to Orban Associates, Inc., San Francisco, Calif.

Continuation of Ser. No. 602,981, Aug. 8, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,193
Int. Cl.[2] H03B *3/02*; H03K *5/08*; H03G *11/04*
U.S. Cl. 328—169 **15 Claims**



1. In a system for controlling peak signal levels in recording or transmission system, or the like which employs high frequency pre-emphasis the combination of:
input means for receiving an input signal;
high frequency pre-emphasis means coupled to said input means, for emphasizing high frequencies of said input signal;
clipping means for clipping a signal, coupled to said pre-emphasis means; and,
a shelving filter coupled to said clipping means having a transfer function which includes a factor in the general form:

$$(aS+1)/(bS+1)$$

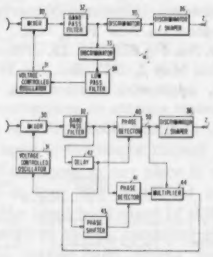
where a and b are non-zero constants and where S is a complex variable;
whereby peak levels of an output of said shelving filter are readily controlled.

4,103,244

FSK DEMODULATOR

Yoichi Tan, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,702
Claims priority, application Japan, Apr. 9, 1976, 51-40656
Int. Cl.[2] H03D *3/00*
U.S. Cl. 329—122 **12 Claims**



1. An FSK demodulator apparatus for receiving and demodulating an FSK-modulated signal that is transmitted with n transmitting frequencies made to correspond to n-level (n being a positive integer equal to or larger than 2) information signals, respectively, comprising a variable frequency oscillator whose frequency is variable in response to a control signal,

a frequency converter circuit for converting said FSK-modulated signal into an intermediate frequency signal by means of an output of said oscillator, and means responsive to the output of said converter circuit for generating said *n*-level information signals and said control signal having at least *n* frequency-stable points which correspond to said *n* transmitting frequencies.

4,103,245

TRANSISTOR AMPLIFIER FOR LOW LEVEL SIGNAL

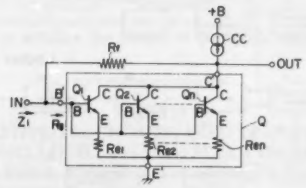
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 17, 1976, Ser. No. 715,200

Claims priority, application Japan, Aug. 29, 1975, 50-104081; Aug. 29, 1975, 50-104082; Aug. 29, 1975, 50-104083; Aug. 29, 1975, 50-118310[U]; Aug. 29, 1975, 50-118311[U]

Int. Cl.² H03F *3/183, 3/68*

U.S. Cl. 330—265 **7 Claims**



5. An audio amplifier circuit for amplifying a signal of low voltage level supplied by a moving coil-type cartridge source, said amplifier comprising:

an input terminal adapted to be connected to said signal source;

an output terminal;

a power source;

transistor means including a plurality of transistors each having base, emitter and collector electrodes, said transistor means having an input resistance of a value less than the value of impedance of said signal source and the transistors being interconnected whereby corresponding electrodes of each transistor are connected, respectively, to the input terminal, the output terminal, and the power source; and

a resistor connected between the output terminal and said input terminal.

4,103,246

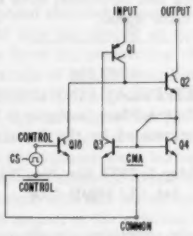
SWITCHABLE CURRENT AMPLIFIER

Allen LeRoy Limberg, Lambertville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,916

Int. Cl.² H03G *3/30*

U.S. Cl. 330—278 **10 Claims**



1. A switchable current amplifier comprising:

first and second transistors respectively of first and second complementary conductivity types, each having base and emitter and collector electrodes;

an input terminal connected to the emitter electrode of said first transistor;

an output terminal to which the collector electrode of said second transistor connects;

an inverting current amplifier having an input connection to the emitter electrode of said second transistor and having an output connection to the base electrode of said first transistor;

a source of control signals; and

means connected to an interconnection between the collector electrode of said first transistor and the base electrode of said second transistor for selectively diverting, responsive to a control signal from said source, collector current flow from said first transistor away from flowing as base current to said second transistor.

4,103,247

VARIABLE GAIN AMPLIFIERS

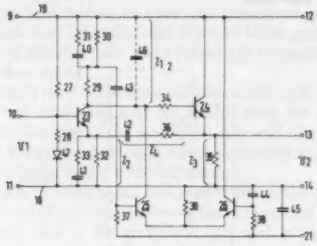
Jean Victor Martens, Deurne-Antwerp, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,266

Claims priority, application Netherlands, Jun. 18, 1976, 7606626

Int. Cl.² H03G *3/30*

U.S. Cl. 330—284 **20 Claims**



1. Automatic active equalizer for a signal pulse transmission cable, said equalizer including:

at least one amplifier means including at least two amplifying devices;

feedback circuit means for intercoupling said amplifying devices, said amplifier having a predetermined closed loop gain versus frequency function;

a gain control output;

means for controlling a variable of said function with a gain control signal derived from said gain control output of said equalizer such that said feedback circuit provides positive feedback.

4,103,248

VOLTAGE FOLLOWER CIRCUIT

Gijun Idei, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1976, Ser. No. 713,244

Claims priority, application Japan, Aug. 12, 1975, 50-97982

Int. Cl.² H03F *3/18, 1/34*

U.S. Cl. 330—288 **10 Claims**

1. A voltage follower circuit comprising:

an input terminal,

an output terminal,

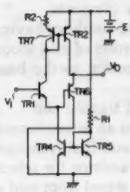
first and second power supply terminals,

a first transistor of one conductivity type having a base connected to said input terminal,

a second transistor, opposite in conductivity type to said first transistor, and having a base connected to the collector of said first transistor, an emitter connected to said first

power supply terminal, and a collector connected to said output terminal,

a third transistor, opposite in conductivity type to said first transistor, and having an emitter connected to said output



terminal, a base connected to the emitter of said first transistor, and a collector coupled to said second power supply terminal, and

a current source connected between the emitter of said first transistor and said second power supply terminal.

4,103,249

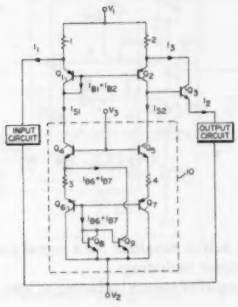
PNP CURRENT MIRROR

Kenneth John Burdick, Trumansburg, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 31, 1977, Ser. No. 846,834

Int. Cl.[2] H03F *3/18*

U.S. Cl. 330—288 **7 Claims**



1. A controlled current source circuit for connection between an input circuit and an output circuit comprising:

first and second PNP transistors, each having an emitter-base junction, and each having a base terminal, an emitter terminal and a collector terminal, said base terminals connected to a first common connection, said collector terminal of said first transistor also connected to said first common connection;

an NPN output transistor having a base terminal, an emitter terminal and a collector terminal, said base terminal connected to said collector terminal of said second PNP transistor, said collector terminal connected to said emitter terminal of said second PNP transistor;

first and second resistors, the value of said first resistor having a ratio with respect to the value of said second resistor, said resistors each having first and second terminals, said first terminal of each of said first and second resistors connected to a first source of D.C. potential, said second terminal of each of said first and second resistors respectively connected to the emitter terminal of each of said first and second transistors;

current bias means with a first terminal connected to said first common connection, with a second terminal connected to said collector terminal of said second transistor and with at least a third terminal connected to a second source of D.C. potential, the magnitude of current flowing through said second terminal having a fixed relationship with respect to the magnitude of current through said first terminal;

said input circuit also connected to said emitter terminal of said first transistor and to at least one source of D.C. potential; and

said output circuit connected to said emitter terminal of said output transistor and to at least one source of D.C. potential.

4,103,250

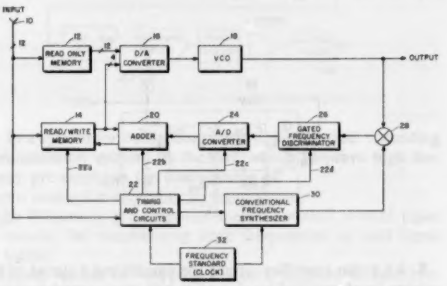
FAST FREQUENCY HOPPING SYNTHESIZER

Harold Wofford Jackson, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 23, 1977, Ser. No. 836,122

Int. Cl.[2] H03B *3/08*

U.S. Cl. 331—1 A **10 Claims**



6. A fast frequency hopping synthesizer which responds to a pseudo random series of command words comprising:

an addressable memory means containing a plurality of individually addressed error signals;

a variable frequency oscillator means for generating an output in response to a combination of a first command signal and an associated error signal, said addressable memory means being addressed by said first command signal to recall said associated error signal;

a frequency synthesizer employing indirect synthesis techniques and responsive to second command signals for generating a sequence of frequency signals, the range of said second command signals encompassing at least the range of said first command signals;

means comparing said first command signals with said second command signals for generating a qualification signal when the comparison is proper;

means responsive to said qualification signal for comparing said sequence of frequency signals with said variable frequency oscillator means output to generate a second error signal; and,

means for adjusting said associated error signal in response to said second error signal.

4,103,251

STABILIZED DELAY LINE OSCILLATOR

Alvin L. Glick, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 793,984

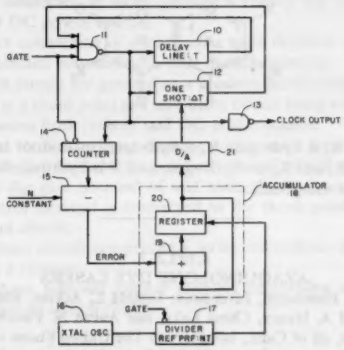
Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—1 A **14 Claims**

1. A stabilized pulse generating circuit comprising:

a delay line clock constructed to provide a repetitive alternating waveform clock output in response to an input signal; and

means coupled to said delay line clock for compensating for changes in the delay line timing period of the clock in order to stabilize the period of the clock output at a selected value.

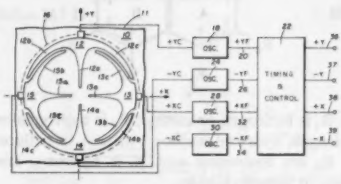


4,103,252

CAPACITIVE TOUCH-ACTIVATED TRANSDUCER SYSTEM INCLUDING A PLURALITY OF OSCILLATORS

Thomas W. Bobick, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,907
Int. Cl.[2] Q01D *21/04*; H01G *7/00*; H03K *3/72*
U.S. Cl. 331—48 **19 Claims**



1. A capacitive activated transducer, comprising:
a sensor responsive to a touch by a human operator to generate a change in capacitance,
an oscillator connected to said sensor and generating a signal at a frequency varying with the capacitance of said sensor, and
means for gating a pulse train signal to an output terminal, said means connected to said oscillator and responsive to a time window varying with the frequency of said oscillator.

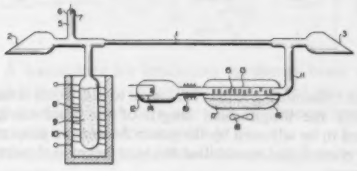
11. A sensor for a capacitive activated transducer, comprising:
a first pair of opposed electrodes positioned along a first of two orthogonal axes and spaced an equal and predetermined distance from the intersection of said orthogonal axes, each electrode of said first pair having a shape symmetrical with said first orthogonal axis, and
a second pair of opposed electrodes positioned along the second of said two orthogonal axes and spaced an equal and predetermined distance from the intersection of said orthogonal axes, each electrode of said second pair having a shape symmetrical with said second orthogonal axis and positioned with respect to the adjacent electrodes of said first pair such that a predetermined portion of the periphery of said electrode is spaced a predetermined distance from a corresponding portion of said adjacent electrodes, whereby a change in capacitance may be sensed with respect to the two orthogonal axes when the sensor is touched by a human operator.

4,103,253

METAL VAPOR LASER GENERATING APPARATUS

Kathumi Tokudome, Hidaka; Michio Ishikawa, Kawagoe, and Noboru Kamide, Tokyo, all of Japan, assignors to The Kimmon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,521
Claims priority, application Japan, Dec. 24, 1975, 50-153430
Int. Cl.[2] H01S *3/03*
U.S. Cl. 331—94.5 G **15 Claims**



1. A metal vapor laser generating apparatus comprising:
a laser fine tube including a peripheral side wall having first and second ends and containing rare gas;
Brewster windows provided at said first and second ends of said fine tube, respectively;
a first branch tube having an open end connected near but spaced from the first end of said fine tube to the peripheral side wall of said fine tube, and a sealed end through which is inserted an anode;
a second branch tube including a peripheral side wall having an open end connected near but spaced from the second end of said fine tube to the peripheral side wall of said fine tube, and a sealed end through which is inserted a cathode for effecting discharge with said anode;
a sealed vessel housing metal and connected to the peripheral side wall of said fine tube near said connection of said first branch tube to the peripheral side wall of said fine tube, said metal being evaporated by heating and being introduced into said fine tube so as to be ionized by said discharge and provide an active medium for laser;
a plurality of fine apertures provided over a given length of the peripheral side wall of said second branch tube at a central portion thereof between said sealed end thereof and said fine tube, said apertures having a size such that the evaporated metal passes through the apertures, but without causing leakage of the discharge current passing through said second branch tube and passing by said apertures, said apertures being provided over a length of said second branch tube which is greater than the inner diameter dimension of said second branch tube; and
a sealed outer tube surrounding the apertured portion of said second branch tube and housing an adsorbent for adsorbing the evaporated metal passing through said apertures into said sealed outer tube.

4,103,254

TUNABLE FREQUENCY LASER

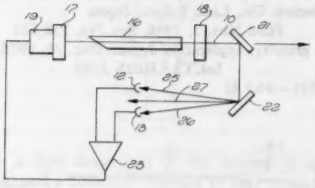
Leslie F. Chikami, 114-19th St., Hermosa Beach, Calif. 90254

Filed Nov. 10, 1976, Ser. No. 740,350
Int. Cl.[2] H01S *3/13*
U.S. Cl. 331—94.5 S **9 Claims**

1. A stabilization system for stabilizing a laser beam to a desired frequency, which laser beam is produced between the longitudinal ends of a laser cavity, comprising:
control means adapted to adjust the longitudinal length of the laser cavity;
means for dispersing at least a portion of said laser beam into separate frequency components;
means for receiving the dispersed frequency components

and detecting the occurance of those components having frequencies which are above and below a desired frequency component;

means for producing an error signal in response to the detection of frequency components having frequencies which are above or below the desired frequency and,



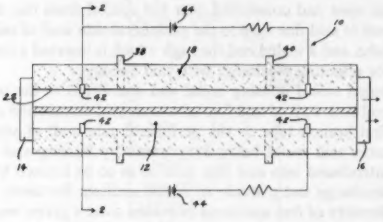
means for transmitting said error signal to said control means whereby the longitudinal length of the laser cavity is adapted to be adjusted by the control means in proportion to the error signal to stabilize the laser beam at the desired frequency.

4,103,255

HIGH POWER, COMPACT WAVEGUIDE GAS LASER

Howard R. Schlossberg, 9 Turning Mill Rd., Lexington, Mass. 02173

Filed Mar. 10, 1977, Ser. No. 776,388
Int. Cl.[2] H01S *3/03*
U.S. Cl. 331—94.5 C **10 Claims**



1. A high power compact waveguide laser comprising a resonant cavity, an elongated housing located within said resonant cavity, a longitudinal chamber located within said housing and containing a lasing medium, means for dividing said longitudinal chamber into a plurality of longitudinal waveguides, said dividing means being transmissive to the emission wavelength of said lasing medium, means for admitting said lasing medium into said waveguides and means for causing a lasing action to take place within said lasing medium located within each of said waveguides whereby leakage of laser radiation between adjacent waveguides through said dividing means causes the coupling of the phases of the waveguide modes and thereby produces a laser output of high power.

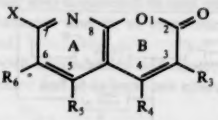
4,103,256

AZACOUMARIN DYE LASERS

Peter R. Hammond, Livermore; Ronald L. Atkins, Ridgecrest; Ronald A. Henry, China Lake, and Aaron N. Fletcher, Ridgecrest, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,889
Int. Cl.[2] H01S *3/20*
U.S. Cl. 331—94.5 L **11 Claims**

1. A dye laser comprising a laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration in a non-interfering solvent, of a dye having the following formula



wherein R_3 is hydrogen; R_4 is hydrogen, methyl, or trifluoromethyl; R_5 and R_6 are hydrogen; and X is hydroxy, dimethylamino, or morpholino.

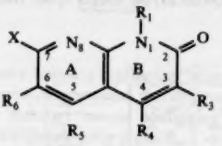
4,103,257

AZAQUINOLONE DYE LASERS

Peter R. Hammond, Livermore; Ronald L. Atkins, Ridgecrest; Ronald A. Henry, China Lake, and Aaron N. Fletcher, Ridgecrest, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,764
Int. Cl.[2] H01S *3/20*
U.S. Cl. 331—94.5 L **17 Claims**

1. A dye laser comprising a laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said solution comprising a lasing concentration in a non-interfering solvent, of a dye having the following formula:



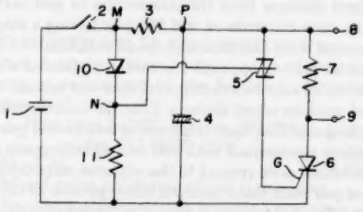
wherein R_1 is hydrogen or methyl; R_3 is hydrogen or methyl; R_4 is hydrogen, hydroxy, methoxy, methyl, or trifluoromethyl; R_5 and R_6 are hydrogen; and X is hydroxy, amino, methylamino, or dimethylamino,.

4,103,258

PULSE GENERATOR INCLUDING A CAPACITOR WHICH IS DISCHARGED THROUGH A THYRISTOR

Takahiko Iida, and Yasunobu Arita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,217
Claims priority, application Japan, Mar. 18, 1976, 51-32788[U]; Mar. 25, 1976, 51-36223[U]; Mar. 25, 1976, 51-36224[U]; Jun. 22, 1976, 51-82580[U]; Jul. 9, 1976, 51-91968[U]; Aug. 5, 1976, 51-105335[U]
Int. Cl.[2] H03K *3/35*
U.S. Cl. 331—111 **11 Claims**



1. A pulse generating circuit which comprises:

a DC power source having a positive terminal and a negative terminal;

a capacitor having a positive terminal and a negative terminal connected in series through a resistor for charge to said DC power source;

a series connection of a load and a main thyristor which is connected between both ends of said capacitor

a shunt circuit for generating a predetermined shunt potential at a shunt point and said shunt circuit being connected between both ends of said DC power source;

a three terminal trigger element whose main terminals are connected between the positive terminal of said capacitor and the gate terminal of said main thyristor and whose control terminal is connected to the shunt point of said shunt circuit;

said shunt circuit comprising a series connection of a diode and a resistor;

said three terminal trigger element comprising a silicon unilateral switch (SUS).

4,103,259

SEMICONDUCTOR OSCILLATOR FOR VERY SHORT WAVES

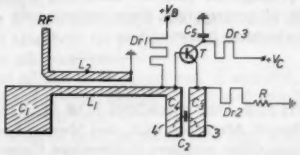
Kurt Lindner, Ulm, Donau, and Werner Wiesbeck, Neu-Ulm, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Mar. 28, 1977, Ser. No. 782,090

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613119

Int. Cl.² H03B *5/18*

U.S. Cl. 331—117 D **15 Claims**



1. In a semiconductor Clapp oscillator circuit for very short waves, particularly for UHF, including a series resonant circuit connected to an active semiconductor device and to a capacitive voltage divider, including first and second series connected capacitors, whose output is connected to said active semiconductor device for providing the feedback signal for the oscillator circuit; the improvement wherein: at least all of the discrete frequency determining capacitive and inductive components of said oscillator circuit are formed according to the stripline technique; a third capacitor whose capacitance is of the same order of magnitude as said first capacitance is connected in parallel with said capacitive voltage divider; and said first, second and third capacitors are formed according to the stripline technique, said first and third capacitors being formed by first and second conductor electrodes respectively which are arranged parallel to one another at a mutual spacing which is very small with respect to their geometrical dimensions and which are associated with a spaced common return electrode, said first and second conductor electrodes having a length and width corresponding to their associated capacitances, and said mutual spacing of said first and second parallel conductor electrodes is selected according to the desired capacitance of said second capacitor so that said second capacitor is formed by said first and second parallel conductor electrodes.

4,103,260

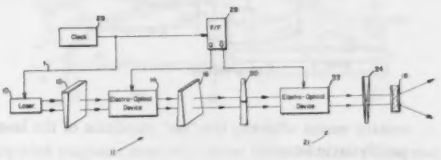
SPATIAL POLARIZATION CODING ELECTRO-OPTICAL TRANSMITTER

William W. Buchman, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 3, 1977, Ser. No. 756,292

Int. Cl.² G02F *1/26*

U.S. Cl. 332—7.51 **18 Claims**



1. A transmitter for producing an energy beam which has encoded thereon as a polarization state of the energy, position along a selected one of a plurality of dimensions across the beam, said transmitter comprising:

a laser unit which provides a beam of linearly polarized energy;

a plurality of switchable modulators arranged relative to said laser unit and to one another so that the laser energy passes sequentially through each of said modulators; and

with said modulators each comprising an electro-optical device coupled between a pair of birefringent wedges, with said electro-optical device including means for switching between a selected one of two states, with the polarization of the energy passing through said electro-optical device being transformed by a first amount when said electro-optical device is in its first state and transformed by a second amount when it is in its second state, and with said wedges having their fast and slow axes oriented at approximately 45 degress to the polarization of the energy provided by said laser unit and having their optical axes substantially perpendicular to the energy beam, and with said wedges being configured and oriented so that energy everywhere within the beam, in passing through said pair of wedges, passes through substantially the same amount of birefringent material and so that when said electro-optical device is in said first state the birefringence of said wedges combines so as to cause no substantial polarization encoding across the beam of energy at the output of said modulator and when said electro-optical device is in said second state the birefringence of said wedges combines so that the energy at the output of said modulator is polarization encoded along a preselected dimension across the beam.

4,103,261

LASER BEAM SHUTTER AND BEAM INDICATOR

John M. Carr, Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Jun. 25, 1976, Ser. No. 699,784

Int. Cl.² H01S *3/10*

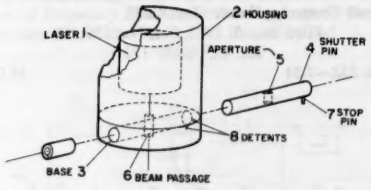
U.S. Cl. 332—7.51 **5 Claims**

1. A unitary laser beam shutter and laser "on-off" indicator for use with a laser beam source comprising:

a unitary shutter and "on-off" indicator means movable between beam passing and beam interrupting position;

said unitary shutter and "on-off" indicator means being adapted, when in the beam interrupting position, to direct

reflected light from the laser beam to a visually observable position from which position light is emitted from said



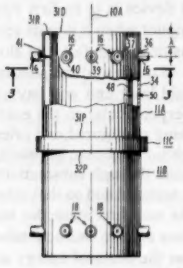
unitary means whereby the "on" condition of the laser is positively indicated.

4,103,262

DUAL CHANNEL TRANSMISSION OF MICROWAVE POWER THROUGH AN INTERFACE OF RELATIVE ROTATION

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,333
Int. Cl.[2] H01P *5/12*
U.S. Cl. 333—6 **6 Claims**



1. Apparatus that provides an interface of relative rotation for a transmission therethrough of microwave power from first and second signal sources, comprising:

similar first and second outer tubular conductors;

similar first and second inner tubular conductors coaxially disposed within said first and second outer conductors, respectively;

a substantially hollow coupling assembly that provides a noncontacting electrical coupling between proximal ends of said outer conductors and between proximal ends of said inner conductors with said first and second conductors in axial alignment and rotatable with respect to each other;

a number of ports disposed with equal arcuate spacing therebetween within each outer conductor approximately one-quarter of a wavelength associated with a voltage provided by one of said sources from the distal ends of said conductors, the number of said ports being in accordance with a relationship which is given as:

$N=4H$

where N is the number of said ports; and

H is an integer greater than one; and

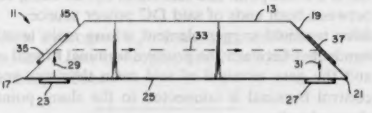
an electrically conductive ring connected to the distal ends of said first conductors.

4,103,263

TRIPLE-TRANSIT-SUPPRESSED BULK ACOUSTIC WAVE DELAY LINE

Rolf D. Weglein, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 7, 1977, Ser. No. 785,374
Int. Cl.[2] H03H *9/30*
U.S. Cl. 333—30 R **3 Claims**



1. A triple transit signal-suppressed bulk acoustic wave delay line comprising:

a body of material capable of supporting propagating longitudinal and shear wave modes of acoustic energy, said body including at least one longitudinal-shear wave mode converting wall defining a relatively long but relatively low-attenuation per unit time, shear wave mode propagation path within said body angularly disposed with respect to the plane of said mode converting wall;

transducer means disposed on said body for converting electromagnetic wave energy to acoustic wave energy and the converse thereof, and for directing and receiving propagating longitudinal wave mode acoustic energy to and from said mode converting wall along relatively short but relatively higher attenuation per unit time, longitudinal wave mode propagation paths within said body angularly disposed with respect to said plane of said mode converting wall and to said shear wave mode propagation path; and

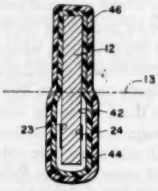
shear wave mode attenuation means in the form of a disc is disposed on said mode converting wall in said shear wave mode propagation path for absorbing a predetermined amount of propagating shear wave mode energy and thereby increase insertion loss.

4,103,264

WAVE FILTER AND PROCESS FOR MAKING SAME

Glenn N. Howatt, Metuchen, N.J., and Murray Leonard, Mayfield Village, Ohio, assignors to Vernitron Corporation, Bedford, Ohio

Filed Jan. 30, 1976, Ser. No. 653,715
Int. Cl.[2] H03H *9/04, 9/10, 9/20;* **H01L** *41/22*
U.S. Cl. 333—72 **7 Claims**



1. In a process of producing electronic components such as filters, comprising the steps of providing a polarized wafer body having piezoelectrically active regions;

depositing a disposable material selected from the group consisting of 1,4-dichlorobenzene and iodine on at least said active regions;

subsequently applying to the wafer and on the disposable material a porous protective coating;

heat treating the wafer to sublimate or evaporate said dispos-

able material through said coating establishing a cavity between the wafer body and said coating;

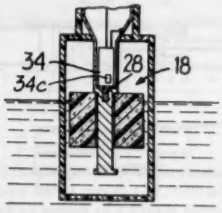
said disposable material being sublimatable at elevated temperatures and in a solid state at temperatures below 80° F.

4,103,265

FLUID BILEVEL SENSOR

Hemming G. Siiberg, Summit, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Sep. 10, 1976, Ser. No. 722,023
Int. Cl.[2] H01H *9/00*
U.S. Cl. 335—205 **6 Claims**



1. A fluid level sensor comprising:

(a) a chamber;

(b) a magnetically actuatable switch having at least one pair of contacts in said chamber;

(c) differential float means guidingly contained within said chamber;

(d) said differential float means having a float body containing an axial bore;

(e) said float body having a specific gravity lower than said fluid;

(f) said float body being adapted to floatable displacement upon said fluid within said chamber;

(g) a rod slideable in said axial bore and passing completely therethrough;

(h) a collar at each end of said rod, said collars being larger than said axial bore for preventing the withdrawal of said rod from said axial bore;

(i) a magnet affixed to the upper end of said rod;

(j) said rod and magnet having a combined specific gravity greater than said fluid;

(k) said differential float, including said float body, rod and magnet, having a combined specific gravity lower than said fluid;

(l) said differential float means being operative to move said magnet within actuating distance of said magnetically actuatable switch upon the recurrence of a first predetermined fluid level;

(m) a mass of magnetically attractable material near said magnetically actuatable switch;

(n) the attraction of said magnetically actuatable material for said magnet being sufficient to support said rod but insufficient to support both said rod and said float body; and

(o) said rod and float body being operative to detach said magnet from said magnetically attractable material upon the occurrence of a second predetermined fluid level lower than said first predetermined fluid level.

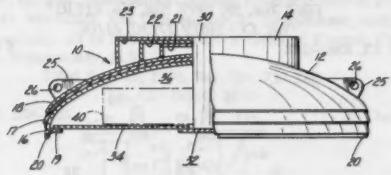
4,103,266

COOLED LIFTING MAGNET WITH DAMPED EDDY CURRENTS AND METHOD FOR ITS FABRICATION

Charles A. Schwartz, 23366 Commerce Park, Beachwood, Ohio 49122

Filed Sep. 3, 1976, Ser. No. 720,256
Int. Cl.[2] H01F *7/20*
U.S. Cl. 335—289 **9 Claims**

1. In an electromagnet for lifting magnetizable material, said electromagnet having an electrical winding connected to a power source, said winding being disposed on a central core, and a dome-shaped metal case within which said electrical winding is disposed, the improvement comprising said dome-shaped metal case including plural arcuate steel shells in nesting relationship one with another each of said shells being in



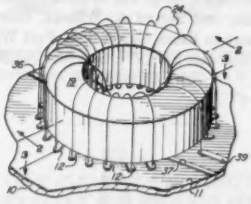
unimpeded magnetic communication with the other shells, and with said central core, said dome-shaped metal case and said central core having a radial slot extending from near the center of said core and longitudinally therethrough, to near the periplery of said dome-shaped metal case.

4,103,267

HYBRID TRANSFORMER DEVICE

Wilfred W. Olschewski, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Jun. 13, 1977, Ser. No. 806,053
Int. Cl.[2] H01F *15/02, 27/30*
U.S. Cl. 336—65 **18 Claims**



1. A hybrid transformer device for use in a hybrid integrated circuit, said hybrid transformer device comprising in combination:

(a) a non-conductive substrate having a planar surface;

(b) a plurality of metalized coating conductors formed on said planar surface, each of said conductors having a predetermined length with first and second ends;

(c) a closed loop magnetic core unit adhesively mounted on said substrate over said metal conductors, said closed loop magnetic core unit being an integral unit formed prior to being adhesively mounted on said substrate, said closed loop magnetic core unit having substantially elevated sides to increase the inductance and power handling capability and lower the losses of said hybrid transformer device;

(d) insulating means electrically insulating said closed loop magnetic core unit from said metal conductors; and

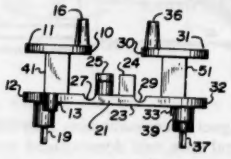
(e) a plurality of metal wire bonding conductors of predetermined length each having first and second ends and looping over said closed loop magnetic core unit to form transformer windings, the first end of each of said metal wire bonding conductors being wire bonded to the first end of a different one of said metal conductors, the second end of each of said metal wire bonding conductors being wire bonded to the second end of a different one of said metal conductors.

4,103,268

DUAL COIL HINGED BOBBIN ASSEMBLY

Raymond H. Anders, Madison; William F. Wernet, Huntsville; Gerald W. Foster, Somerville, and Ronald C. Ward, Huntsville, all of Ala., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jun. 29, 1977, Ser. No. 811,027
Int. Cl.[2] H01F 27/30, 41/06
U.S. Cl. 336—208 8 Claims



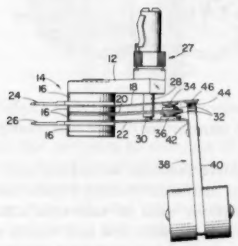
1. A dual bobbin assembly comprising: first and second spool like bobbin elements normally positioned parallel to each other, each including a first flange at a first end of said bobbin element and a second flange at a second end of said element; hinge means flexibly connecting said second flange of said first element to said second flange of said second element; and engaging means included in the exterior side of each of said second flanges; whereby said bobbin elements may be further manually positioned axi-symmetrically and releasably retained in said axi-symmetric position by said hinge means and said engaging means.

4,103,269

THERMOSTAT AND TIP SWITCH ASSEMBLY

Jack W. Grable, and Steven A. Willeke, both of Mansfield, Ohio, assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 21, 1977, Ser. No. 761,505
Int. Cl.[2] H01H 71/16
U.S. Cl. 337—67 6 Claims



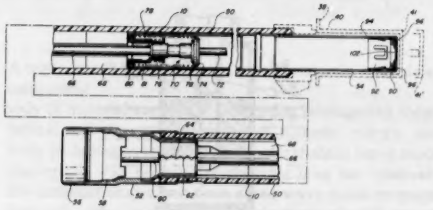
1. A combination thermostat t.ρ switch assembly, comprising:
- a rigid base member;
- a stack mounted upon said base member;
- three elongated resilient leaves mounted co-extensively with one another upon said stack;
- one of said leaves being thermally responsive;
- means for making electrical contact to the outer leaves;
- a thermally responsive contact set comprising an electrical contact mounted upon said thermally responsive leaf and a cooperating electrical contact mounted upon an adjacent leaf;
- a position sensitive contact set comprising an electrical contact mounted upon the third leaf and a cooperating electrical contact mounted upon an adjacent leaf;
- said thermally responsive contact set and said position sensitive contact set together being capable of completing the circuit between said outer leaves; and
- position sensitive means for operating said position sensitive contact set.

4,103,270

SEALING ARRANGEMENT FOR HIGH VOLTAGE FUSE

Hiram Soloman Jackson, Jr., Northbrook, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,015
Int. Cl.[2] H01H 71/20
U.S. Cl. 337—178 8 Claims



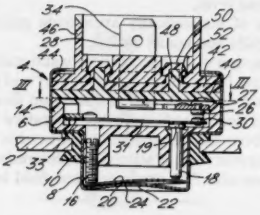
1. In a high voltage fuse of the type having a moveable spring biased arcing rod with a striker pin on the end of the arcing rod, an improved sealing arrangement comprising a round metal plate mounted at one end of the fuse, said metal plate having a round annular outer portion and a center portion machined to reduce the thickness of the center portion, said center portion having been subjected to a pressing operation to further reduce the thickness of said center portion and to also increase the hardness and smoothness of said center portion so that said center portion can be reliably punctured by the striker pin during fuse operation.

4,103,271

THERMOSTATS

John Crawshaw Taylor, Edge Lee, Bishops La., and Richard Antony Phillips, Ruabon, 145 Light Wood Rd., both of Buxton, Derbyshire, England

Filed Apr. 6, 1977, Ser. No. 785,096
Claims priority, application United Kingdom, Apr. 8, 1976, 14331/76
Int. Cl.[2] H01H 37/04, 37/52
U.S. Cl. 337—372 10 Claims



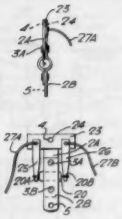
1. A thermostat including an electrical switch and a switch actuator comprising a bimetallic disc movable between oppositely dished configurations with a snap action, a stop engageable with one edge portion of the disc, a switch contact operating member engaging with a generally diametrically opposite disc edge portion, a fulcrum engageable with said disc and about which said disc moves during its snap-action, the fulcrum being disposed intermediate said disc edge portions and at or near the centre of the disc.

4,103,272

COMBINATION FUSE, ESPECIALLY FOR FIRE PROTECTION INSTALLATIONS

Ole Arvid Larsen, Micheletveien 38A, Oslo 10, Norway

Filed Feb. 7, 1977, Ser. No. 766,201
Claims priority, application Norway, Feb. 13, 1976, 760479
Int. Cl.[2] H01H 37/76; A62C 37/30
U.S. Cl. 337—411 8 Claims



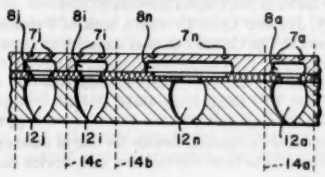
1. A combination fuse, especially for fire protection installations, comprising two metal pieces (2A, 2B) which normally are bonded together by means of a fusible metal (3A, 3B) and during normal condition prevent a trip mechanism to be operated, whereas at a temperature above normal ambient temperature the fusible metal loses its binding ability and releases the trip mechanism, and a heat dissipating means adapted to dissipate heat to raise the temperature of the fusible metal for releasing the combination fuse, the dissipation of heat being initiated in response to a signal generated by the sensing of local or remote ambient conditions, characterized in that the heat dissipating means is an electric resistance element (20) incorporated in a circuit which is electrically separated from the two said metal pieces (2A, 2B) and the other components included in the fire protection installation, and that the resistance element (20) is connected in the circuit by members which upon tripping of the combination fuse ensure that the resistance element is disconnected from the circuit for the breaking thereof.

4,103,273

METHOD FOR BATCH FABRICATING SEMICONDUCTOR DEVICES

Hans W. Keller, Excelsior, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 354,589, Apr. 26, 1973, which is a division of Ser. No. 128,420, Mar. 26, 1971, Pat. No. 3,757,414.
This application Sep. 30, 1974, Ser. No. 510,279
Int. Cl.[2] G01L 1/22
U.S. Cl. 338—2 31 Claims



1. A method for batch fabricating semiconductor material stress sensors comprising:

forming access holes at selected locations through a first major surface of a first wafer of said semiconductor material,

bonding a second wafer of said semiconductor material to said first wafer having said access holes therein,

forming electrical elements in said second wafer at locations corresponding to said access holes through a second major surface of said second wafer, and

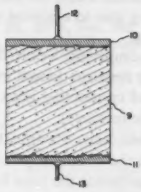
partitioning said joined wafers to form said stress sensors.

4,103,274

RECONSTITUTED METAL OXIDE VARISTOR

James F. Burgess, Schenectady; Roland T. Girard, Scotia; Francois D. Martzloff, and Constantine A. Neugebauer, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,388
Int. Cl.[2] H01C 7/10
U.S. Cl. 338—21 25 Claims



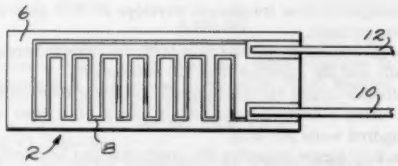
1. A reconstituted metal oxide varistor comprising a composite of metal oxide varistor ceramic particles in a plastic resin matrix.

4,103,275

RESISTANCE ELEMENT FOR RESISTANCE THERMOMETER AND PROCESS FOR ITS MANUFACTURING

Walter Diehl, Hanau, and Wolfgang Koehler, Hörstein, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Feb. 18, 1976, Ser. No. 659,144
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507731
Int. Cl.[2] H01C 3/04
U.S. Cl. 338—25 32 Claims



1. A resistance element for a resistance thermometer consisting essentially of an insulating body as a support and a thin platinum layer thereon as the resistance material, said support being made of a material having a greater thermal coefficient of expansion greater than platinum between the range of 0° to 1000° C.

4,103,276
RESISTOR CORE CABLE

James L. Kennon, Avon, and Robert E. Sandorf, West Richfield, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 14, 1976, Ser. No. 705,363
Int. Cl.[2] H01C 3/06
U.S. Cl. 338—214 15 Claims

1. An elongated electric cable for use in connecting an electrostatic spray coating gun to a source of high voltage electrical power comprising:

an electrical path comprising a core of a series of rigid elongated non-brittle resistors joined end to end by means of flexible elongated conductive links electrically connected between separate resistors;

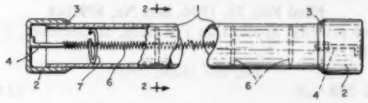
a uniform continuous dielectric sheath which is substantially less flexible than the conductive links, which is flexurally elastic, which surrounds the core for its length and which will not permanently deform under normal flexing of the cable;

wherein the length of the resistor is longer than the shortest length of resistor which could remain at the midpoint of a loop when such a loop is pulled from the ends of the cable in normal use.

4,103,277
CERAMIC ENVELOPED ELECTRICAL HEATING ELEMENT

Robert M. Griffin, South Hamilton; Max E. Oberlin, Lynn, and Robert P. Bonazoli, Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 17, 1976, Ser. No. 751,660
Int. Cl.[2] H01C 1/024
U.S. Cl. 338—237 2 Claims



1. An electrical resistance heating element comprising:

an elongate hollow translucent envelope of 99% pure alumina ceramic,

end caps bonded at opposite ends of the envelope to hermetically seal the envelope from the atmosphere,

an elongate coiled refractory metal conductor dimensioned to carry a linear power loading rating of at least one hundred watts per inch,

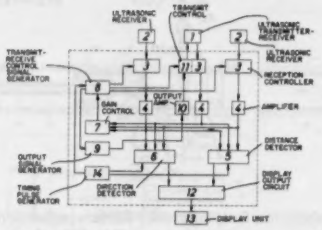
refractory means engaging the conductor and envelope at spaced locations along their lengths for holding the conductor spaced from the envelope substantially coaxially therewith, and

conductive means for supplying electrical current to the conductor at said power loading so as to ohmically heat the conductor and transmit heat externally of the envelope.

4,103,278
OBSTACLE DETECTING APPARATUS USING ULTRASONIC WAVES

Kanje Satake, No. 1075-9, Amanuma, Chigasaki-shi, Kanagawa-ken; Yasuo Shimazu, No. 1748-1, Kagawa, Chigasaki-shi, Kanagawa-ken; Masaru Kasahara, 2-4-2-206, Suwa, Tama-shi, Tokyo, and Seya Adachi, 3-14-20, Higashiterao, Tsurumi-ku, Kawasaki-shi, Kanagawa-ken, all of Japan

Filed Dec. 6, 1976, Ser. No. 747,539
Int. Cl.[2] G01S 9/68, 7/54, 7/56
U.S. Cl. 340—1 R 4 Claims



1. An obstacle-detecting apparatus using ultrasonic waves comprising, in combination, an ultrasonic transmitter-receiver having a transmit and a receive mode; an ultrasonic receiver spaced a predetermined distance from the transmitter-receiver; control means operative for causing the transmitter-receiver to assume its transmit mode and transmit an ultrasonic wave into space for impingement upon and reflection back from an obstacle to be located and then to assume its receive mode so that both the transmitter-receiver and the receiver will receive an ultrasonic wave reflected from the obstacle; distance-determining means operative for determining the distance to the obstacle and generating a corresponding distance signal at least in dependence upon the travel distance of the wave transmitted by and then received by the transmitter-receiver; and direction-determining means operative for determining the direction in which the obstacle is located relative to the transmitter-receiver and generating a corresponding direction signal by determining a circular distance-locus whose radius is dependent upon at least the travel distance of the wave transmitted by and then received by the transmitter-receiver, by determining an elliptical distance-locus whose focalradii-sum is dependent upon at least the travel distance of the wave transmitted by and then received by the transmitter-receiver and the travel distance of the wave transmitted by the transmitter-receiver and received by the receiver, and by determining the intersection of these two loci.

4,103,279
DIVER NAVIGATION SYSTEM

Clell A. Dildy, Jr., and Lyles C. Adair, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 25, 1977, Ser. No. 818,643
Int. Cl.[2] G01S 9/66; G01C 23/00
U.S. Cl. 340—3 D 12 Claims

1. An underwater navigation device for use in making good a predetermined course over the bottom, said device comprising in combination:

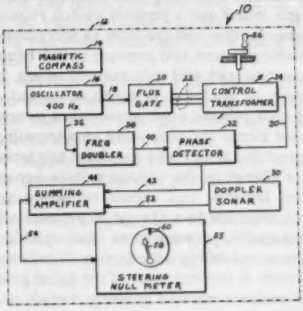
a steerable support structure;

at least a first compass means, carried by said structure, for providing a first analog signal representative of heading differences between the actual heading and said predetermined course;

doppler sonar means, carried by said support structure and responsive to travel over the bottom, for providing a second analog signal representative of drift angle relative to said actual heading;

summing means, responsive to said first and second analog

signals, for providing a third analog signal representative of steering corrections required to make good said predetermined course; and



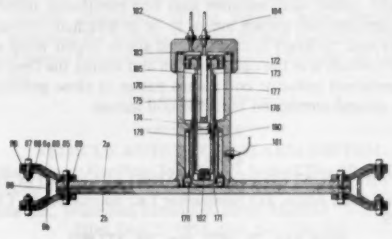
indicator means, responsive to said third analog signal, for providing a sensible indication of said steering corrections.

4,103,280

DEVICE FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM

Jacques Cholet, Rueil-Malmaison; Jean Laurent, Saint Germain-En-Laye; Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, France

Filed Nov. 20, 1973, Ser. No. 417,570
Claims priority, application France, Nov. 29, 1972, 72.42515
Int. Cl.[2] H04R *23/02*
U.S. Cl. 340—12 R **11 Claims**



1. In a device for emitting acoustic waves in a liquid medium of the type having at least two oppositely facing elements movable towards and away from each other, said elements being made of a rigid material and connected by a tightening membrane forming a tight enclosure therewith, each of said elements comprising at least one area for intermittent contact with a corresponding area of the opposite element, means for moving said contact areas apart from each other comprising jack means and means for supplying fluid under pressure thereto, and releasable means for locking said movable elements in spaced apart relationship, the improvement comprising:

(a) said jack means including first and second cylinders and first and second pistons movable relative to said first and second cylinders respectively, said first cylinder having an open end connected with a first of said movable elements;

(b) a push-member displaceable by action of said jack means from a first position entirely within said first cylinder to a second position wherein said push-member extends from said open end into contact with a surface of the other of said oppositely facing elements so as to displace said other element relative to said first element;

(c) releasable pressure actuated means for maintaining said push-member in said second position without said jack means acting upon said push-member; and

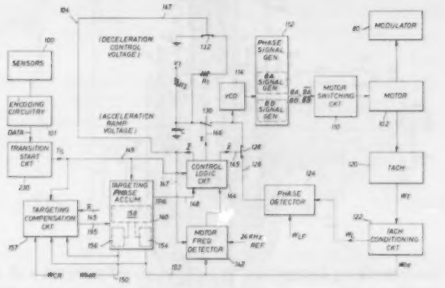
(d) means for releasing said means for maintaining so as to permit said push-member to return to its first position independent of said jack means, thereby producing an acoustic wave by the return of said elements to their non-displaced position.

4,103,281

MEASURING-WHILE-DRILLING SYSTEM HAVING MOTOR SPEED DETECTION DURING ENCODING

Gerald A. Strom, Dayton, and James I. Bernard, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,687
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 LD **25 Claims**



19. In a measuring-while-drilling system including a motor driven acoustic generator for imparting to well fluid an acoustic signal having an intermittently constant frequency, the method of momentarily changing the speed of the motor to effect a desired amount of change in the phase state of the signal thereby to provide modulated data states to the signal, comprising the steps of:

(a) generating a motor speed signal representative of the instantaneous speed of the motor;

(b) changing the speed of the motor in a first direction;

(c) stopping said motor speed change in the first direction when a value of phase shift which is less than the desired change in phase has been accumulated;

(d) changing the speed of the motor in a second direction to accumulate at least partially the remainder of said desired amount;

(e) generating an end-of-return signal in response to the motor speed signal when the speed of the motor has been returned to the speed corresponding to said constant frequency; and

(f) stopping said speed change in response to said end-of-return signal.

4,103,282

ACOUSTICAL TIRE PRESSURE VALVE

Edward J. Cook, South Hamilton, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.

Filed Nov. 3, 1975, Ser. No. 627,959
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 **8 Claims**

1. A device for monitoring the internal pressure in a normally pressurized hollow pneumatic tire having an interior and an exterior, comprising:

(a) a body formed with a cavity therein defining cylindrical inner sidewalls and mountable to a wheel adapted to carry a pneumatic tire,

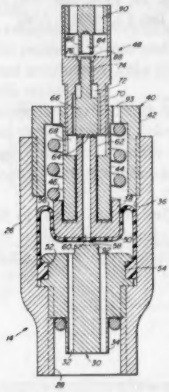
(b) a piston having a pair of ends and mounted for limited reciprocation in said cavity,

(c) a flexible air-impervious rolling seal annular diaphragm connecting said piston to the walls of said cavity, said diaphragm extending across one end of said piston and being formed with a central opening, said diaphragm extending along a portion of the sides of said piston and formed with an annular reverse bend between the sides of said piston and the sidewalls of said cavity,

(d) said body being formed with a passage communicating with the interior of said tire and one end of said cavity on one side of said piston and diaphragm,

(e) spring means engaging said piston and urging it toward said one end of said cavity,

(f) acoustical signal generating means mounted in fixed relative position to one of said body or said piston and responsive to the flow of gas therethrough,



(g) said piston being formed with a piston passage extending from said one end of said piston in register with the diaphragm opening to the other end of said piston and communicating with said signal generating means, said piston being formed with a passage opening at both ends of said piston,

(h) said body being formed with at least a pair of seating surfaces, one on either side of said diaphragm and in position to close said piston passage whenever said piston is at either end of its path of travel, said piston passage being open at intermediate positions of said piston whereby a flow of pressurized gas is delivered from said tire through said body passage and said piston passage to said signal generating means.

4,103,283

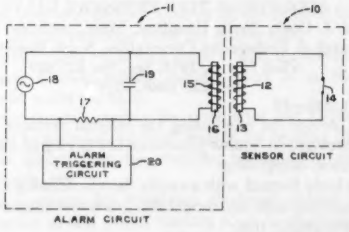
TIRE INFLATION MONITORING SYSTEM

Maw-Huei Lee, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 6, 1976, Ser. No. 730,052

Int. Cl.[2] B60C *23/00*

U.S. Cl. 340—58 **9 Claims**



1. A system for monitoring the inflation of a tire mounted on the wheel of a vehicle comprising a sensor circuit mounted to rotate with said vehicle wheel and an alarm circuit associated with the vehicle body, said sensor circuit including an inductor coil means wound on a powder core and mounted to rotate with said vehicle wheel and a pressure switch responsive to a change in pressure within said tire from an acceptable pressure to an unacceptable pressure, said pressure switch being in serial electrical connection with said inductor coil means, said alarm circuit including in electrical connection an inductor coil means wound on a powder core, capacitance means, resistor means, oscillator means for generating an alternating current signal of constant frequency and an alarm triggering circuit responsive to a change in the voltage pattern across said second-mentioned inductor coil means occurring when said pressure switch responds to a change in pressure within said tire from an acceptable pressure to an unacceptable pressure, said sensor circuit exhibiting an effective distributed capacitance characteristic at the frequency of the signal generated by said oscillator means with said pressure switch in an open condition and said first-mentioned inductor coil being in relatively close proximity to said second-mentioned inductor coil, said second-mentioned inductor coil means being mounted to said vehicle body at a position so that said first-mentioned inductor coil means mounted with said vehicle wheel passes in close proximity to said second-mentioned inductor coil means during each rotation of said vehicle wheel, said second-mentioned inductor coil means and said capacitance means of said alarm circuit being in a "primary circuit" that is in electrical resonance at the frequency of the signal generated by said oscillator means, said first-mentioned inductor coil means containing a number of turns of wire in the coil to cause said first-mentioned inductor coil means to be in electrical resonance with its said effective distributed capacitance at the frequency of the signal generated by said oscillator means with said pressure switch in the open position and during the time said first-mentioned inductor coil means passes in close proximity to said second-mentioned inductor coil means and to cause the circuit that includes said first-mentioned inductor coil means and said switch means to be in matched resonance with the said "primary circuit" of said alarm circuit when said pressure switch is in the open position and during the time said first-mentioned inductor coil means passes in close proximity to said second-mentioned inductor coil means.

4,103,284

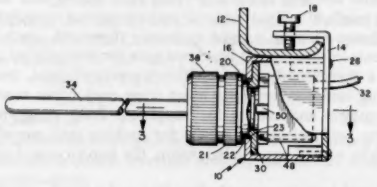
BUMPER MOUNTED VEHICLE OBSTACLE DETECTOR

Raymond John Blake, 311 Shoemaker La., Solana Beach, Calif. 92075

Filed Aug. 25, 1977, Ser. No. 827,602

Int. Cl.[2] B60Q *5/00*

U.S. Cl. 340—61 **3 Claims**



1. A vehicle mounted obstacle detector to provide positive warning of the close approach of the vehicle to obstacles comprising:

a resilient cylindrical probe for contacting obstacles, of selected length rounded on one end and with an attached disc on the opposite end,

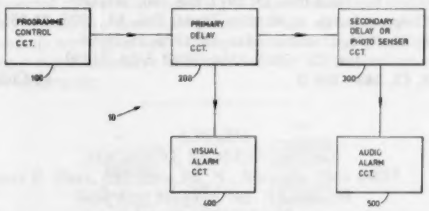
a follower housing shaped as a hollow cylindrical element with a mounting flange at one end and having exterior threads,

a probe cap with a centered hole through which said cylindrical probe passes and having an internal recess into which said probe disc fits loosely to permit the displacement of said disc when said probe encounters an obstacle,
said probe cap being provided with internal threads to engage the external threads on said follower housing and closing one end of said follower housing when threaded thereon,
a probe follower formed as a cup shaped piece with a recessed interior column and having a closed end bearing against said probe disc to transmit any displacement of said probe disc,
a follower push rod attached at one end in said probe follower column recess and provided with a flange at the opposite end,
a circular spring backing plate with a centered hole through which said push rod passes, said backing plate being forced fitted into and closing the other end of said follower housing,
a positioning spring placed between the interior base of said probe follower, surrounding said probe follower internal column, and compressed against said spring backing plate,
a cubical detector housing having a removable access cover forming one side thereof and with a circular opening in the opposite side permitting the passage of said follower housing through said detector housing,
an internally threaded locking ring engaging said exterior threads of said follower housing and securing said follower housing mounting flange against the interior face of said detector housing, said locking ring being provided with an external seal skirt to overlap the threaded end of said probe cup,
a detector housing seal positioned between said locking ring and the adjacent detector housing exterior face,
a normally open electrical control switch mounted within said detector housing and positioned to be in cooperative alignment with said follower push rod flange for closure by movement of said push rod,
means for electrically connecting said control switch in parallel connection in the vehicle horn circuitry for sounding the vehicle horn when said switch is closed,
and means for mounting said detector housing on the vehicle.

4,103,285
VEHICLE ANTI-THEFT ALARM SYSTEM

William Lloyd; Geoffrey John Lloyd, both of The Alamo Powder Works La., Melling, Liverpool, and David Dawson, 14 Thorndale Rd., Waterloo, Liverpool, all of England

Filed Dec. 7, 1976, Ser. No. 748,350
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—65 **23 Claims**

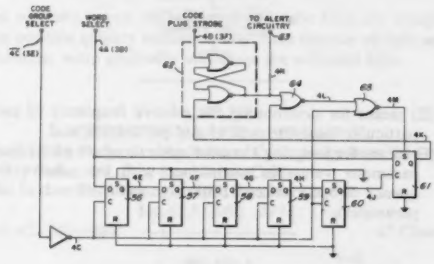


1. An alarm system for a vehicle or trailer comprising:
input means adapted for connection to an electrical power source;
time delay means having an input and an output for applying electrical power to said output after electrical power has been applied to said input for a preset time;
a vibration-responsive switch coupled to said time delay means input and to said input means and responsive to vibration for coupling said time delay means input to said input means; and
a first alarm circuit connected to said time delay means output and adapted for connection to a first alarm device for applying electrical power from said time delay means output to the first alarm device.

4,103,286
DIGITAL BINARY GROUP CALL CIRCUITRY ARRANGEMENT

John Dominic Nicolini, Margate, and David Frank Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1977, Ser. No. 770,327
Int. Cl.[2] G06F *7/02;* **H04M** *11/02*
U.S. Cl. 340—146.2 **8 Claims**



1. In a detector for detecting first and second predetermined words within a train of signals, each word comprising a plurality of binary bits and said words being spaced apart by a first predetermined time period, including timing means for providing first and second control pulses within each bit period, word select means for providing a first signal in response to a first detection of the first word, said first signal presetting the detector for detection of the second word, counter means for counting a second predetermined time period substantially equal to the period of the second word and for providing a signal enabling the detection of the second word at the end of said second period, for counting a third predetermined time period subsequent to the second time period and equal to at least two bit periods, then providing a signal enabling the detection of the first word, group call detect circuitry for detecting said first word twice in sequence and spaced apart by the third predetermined time period, said third period being longer than said first time period, and comprising:
delay means coupled to the timing means and to the counter means for delaying the first word enabling signal for a period at least equal to the third time period; and
bistable means coupled to the delay means for being clamped by the delayed signal, and to the timing means for being triggered by the next first control pulse and reset by the end of the subsequent second control pulse for providing a group call detect signal.

4,103,287
VARIABLE LENGTH CODES FOR HIGH QUALITY IMAGE ENCODING

Amalie Julianna Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

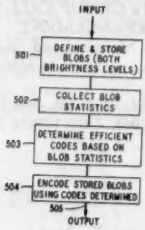
Filed Dec. 17, 1973, Ser. No. 425,506
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 H **13 Claims**

1. Apparatus for encoding a two-dimensional graphic image comprising
(A) means for generating an electrical signal representing successive scans of said graphic image,
(B) means for sampling said electrical signal to derive sam-

ples of said signal, each sample representing a picture element (pel) of said two-dimensional scanned image,

(C) means for associating ordered subsequences of said sequence of samples to define a plurality of like-valued geometrically related image areas (blobs),

(D) means for extracting and storing electrical representations of values for each of a plurality of parameters for each of said blobs,



(E) means for determining the relative frequency of each particular value for each of said parameters, and

(F) means for assigning electrical code words to each of said parameter values in accordance with the relative frequency of occurrence of respective values of each of said parameters.

4,103,288

METHOD FOR DATA TRANSMISSION AND A SYSTEM FOR CARRYING OUT THE METHOD

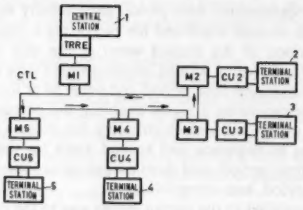
Kjell Harry Westman, Vallingby, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,155

Claims priority, application Sweden, Sep. 18, 1975, 7510432

Int. Cl.[2] H04Q *5/00*

U.S. Cl. 340—152 R **16 Claims**



1. A method for transmission of data between a central station and a number of terminal stations which are connected to a closed series transmission loop provided between the output and the input of the central station, in which the transmission is carried out bit-by-bit in one and the same direction through the loop under control of the central station and in which all data is transferred in the form of a transmission block having an output data phase, a general polling character and an input data phase, each output and input data phase having a data message, which comprises the steps of providing the data message with an address portion comprising a predetermined number of bits indicating in a binary code the address of the terminal station associated with the data message; providing the data message during an output data phase, at least one data message with an address portion comprising a predetermined stations to which the central station has output data to send during the output data phase; providing the transmission block with a general polling character from the central station at the end of the output data phase for preparing the terminal stations having input data to send for transmission; and providing the transmission block with an input data phase after the general polling character, at least one data message being transmitted to the central station during the input data phase by each of the terminal stations prepared in this manner; and providing a subsequent transmission block, also comprising an output data phase, a general polling character and an input data phase, the subsequent transmission block being initiated by the central station when the end of the earlier input data phase is sensed, the lengths of the output and the input phases always being adapted to the actual data transfer need.

4,103,289

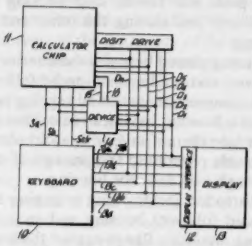
CALCULATOR THEFT PREVENTION DEVICE

Steven Kolber, 59 Hillside Ter., Wayne, N.J. 07470

Filed Apr. 27, 1976, Ser. No. 680,899

Int. Cl.[2] G08B *13/06*; H04Q *1/00*

U.S. Cl. 340—164 R **8 Claims**



1. A security device for a keyboard electronic instrument, in which instrument the keyboard has a plurality of cross-points and a plurality of sense lines and a plurality of digit lines connected thereto, said instrument having scanning means to interrogate the cross-points of said keyboard, the security device being connected to at least some of the digit lines and all of the sense lines, said device including a selection matrix connected to a plurality of the said sense lines and a plurality of the said digit lines, valid actuation discriminator means connected to said selection matrix, a sequence counter means connected to said valid actuation discriminator means to provide a sequence of pulses provided by the sequencing of the keys of said keyboard, and alarm means actuated unless inhibited by said validity means, said alarm means producing a pulse train to cause malfunction of said instrument.

4,103,290

DIGITAL FREQUENCY DISPLAY DEVICE

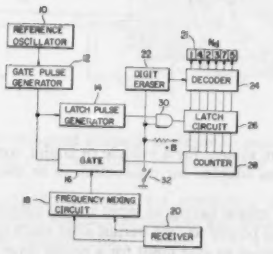
Tadao Sekiguchi, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1977, Ser. No. 767,830

Claims priority, application Japan, Feb. 14, 1976, 51-15115; Feb. 14, 1976, 51-15116; Mar. 18, 1976, 51-29606

Int. Cl.[2] G06F *3/14*; G08B *5/36, 23/00*

U.S. Cl. 340—168 B **11 Claims**



1. A digital frequency display device comprising:

first means for obtaining a count representative of a signal frequency to be displayed;

second means operably connected to said frist means for storing a count provided by said first means and adapted to be placed in a memorizing condition;

third means operably connected to said first and second means for displaying digits and adapted to display digits representative of a count; and

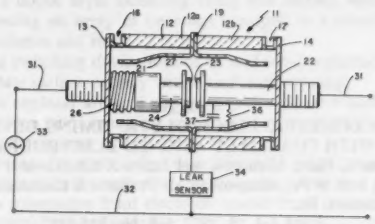
fourth means operably connected to said second means for altering the display of digits provided by said third means when said second means is in the memorizing condition as compared to the display of digits which would be provided were said second means not in said memorizing condition to indicate that said second means is in the memorizing condition.

4,103,291

LEAK SENSOR AND INDICATING SYSTEM FOR VACUUM CIRCUIT INTERRUPTERS

Francis M. Howe, 2741 Calle La Cruz, Carmel, Calif. 93921, and Simon Yin, 40934 Camero Pl., Fremont, Calif. 94538

Filed Sep. 30, 1976, Ser. No. 728,198
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—522 **15 Claims**



1. A leak sensor for vacuum circuit interrupters of the type which include an evacuated envelope, a pair of separable electrodes within the envelope adapted to be connected in series with the circuit, and a metal shield surrounding the electrodes and shielding the envelope against metal deposits comprising a bridge circuit including four arms and four terminals, the impedance in one of said arms being the resistance and leakage stray capacitance between the shield and at least one of said electrodes, said electrode and said shield connected to adjacent bridge terminals, the impedance in the remaining arms being selected to balance the bridge when the vacuum circuit interrupter is operating with normal vacuum, a pair of opposite terminals of said bridge including said electrode bridge terminal being connected to the circuit in which the interrupter is connected to derive its operating voltage directly and continuously therefrom, and means connected to the other pair of terminals serving to sense bridge unbalance and provide an output signal indicative of loss of vacuum in the vacuum circuit interrupter.

4,103,292

MATERIAL SENSING DEVICE

James R. Haas, Old State Rd. N., Norwalk, Ohio 44857

Filed Jun. 16, 1976, Ser. No. 696,768
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—603 **10 Claims**

1. A material sensing device comprising: a flexible light conducting tube having first and second ends, a light emitting device at said first end, a light sensitive device at said second end, said light emitting device providing both direct illumination of said light sensitive device and light which impinges on the internal walls of said tube in the straight line position of said tube, said light sensitive device being sensitive to both the direct illumination of said light emitting device and light reflected from the internal walls of said tube, one end of said flexible tube being received in a support receptacle and the other end being free, said free end of said tube being sealed off,

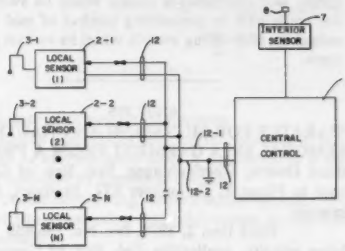
and whereby lateral deflection of said tube from the straight line position quickly attenuates the direct transfer of light and thereafter more gradually attenuates the reflected light.

4,103,293

INTRUSION ALARM APPARATUS

Louis H. La Forge, Jr., San Mateo, Calif., assignor to Tri-Century Industries, Inc., San Mateo, Calif.

Filed Nov. 21, 1975, Ser. No. 634,062
Int. Cl.[2] G08B *13/14*
U.S. Cl. 340—514 **27 Claims**



1. An intrusion detection apparatus for detecting intrusions into an enclosure comprising:

first sensor means for detecting intrusions within a first portion of said enclosure and responsively providing a first sensor output signal,

second sensor means, having a different type of detection operaton than said first sensor means, for detecting intrusions within a second portion of said enclosure and responsively providing a second sensor output signal, where said second portion is in close proximity to said first portion,

control means for detecting said first and second sensor output signals, said control means including means for sensing when said first and second sensor output signals occur within a predetermined time relationship, and said control means including means for generating an alarm signal when said first and second sensor output signals occur within said predetermined time relationship.

4,103,294

INTRUDER DETERRENT APPARATUS AND METHOD

Joseph C. Stettner, and James H. Ott, both of Akron, Ohio, assignors to Novar Electronics Corporation, Barberton, Ohio

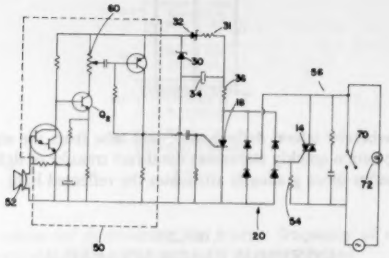
Division of Ser. No. 145,134, May 20, 1971, Pat. No. 3,761,912. This application Feb. 26, 1973, Ser. No. 335,832
Int. Cl.[2] G08B *13/22*
U.S. Cl. 340—566 **2 Claims**

1. A burglar deterrent comprising:

(a) an electrically powered illumination means for ordinarily

illuminating a building region to aid human use of the building and for at times illuminating a region of a building in response to sound;

(b) a sound actuable electronic timing switch means connected to said illumination means and a source of power for switching the current in said illumination means to continuously illuminate said illumination means for a first selected period of time in response to a sufficient sound and for subsequently blocking the current through the



illumination means for a second selected period of time; and

(c) a lighting control switch electrically connected parallel to said timing switch and positioned to facilitate manual control of said illumination means for continuously energizing said illumination means when its switch contacts are made and for permitting control of said illumination means by said timing switch when its switch contacts are open.

4,103,295

APPARATUS FOR SIGNALING AN UNAUTHORIZED REMOVAL OF A GARMENT FROM A PREMISES

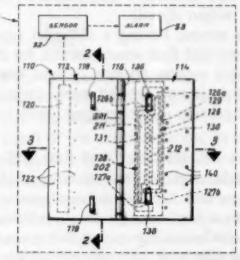
Reinhard Doerre, Oberboihingen, Fed. Rep. of Germany, assignor to Firma E. Breuninger KG., Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,838

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554051

Int. Cl.[2] G08B *13/14*

U.S. Cl. 340—572 **6 Claims**



1. In an apparatus for signalling a removal of a garment from an area provided with a sensing element, first and second elongated plates having corresponding first and second longitudinal edges, one of the plates having signal-transmitting means for emitting an indication detectable by the sensing element when the garment is moved past the sensing element with the one plate affixed to the garment, means joining the respective first longitudinal edges of the first and second plates for pivotal movement between a first closed position in which corresponding first surfaces of the plates are disposed in confronting relation for engaging a portion of the garment and a second closed position in which the first surfaces are disengaged from the garment, the first plate having a plurality of first recesses disposed in the first surface thereof and distributed along the second longitudinal edge thereof, the second plate having a correspondingly distributed plurality of first garment-piercing projections extending outwardly from the first surface thereof for penetraing the garment portion and entering the first recesses of the first plate when the plates are pivoted into their first position, the first plate having a pair of longitudinally spaced second recesses disposed on its first surface, the second recesses being situated in transversely spaced relation to the first recesses; and in which the apparatus further comprises, in combination, a pair of second locking projections individually extending from the first surface of the second plate in aligned relation with the second recesses of the second plate when the plates are brought into the first position, the second projections individually extending into the respective second recesses when the first projections extend into the first recesses, and means for releasably locking the second projections in the associated second recesses.

4,103,296

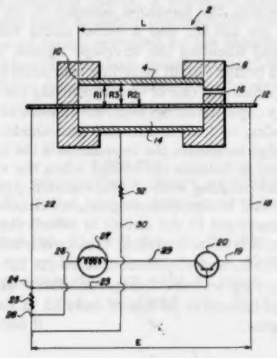
COULOMETRIC ELECTROLYTIC TIMING DEVICE WITH COAXIALLY ALIGNED ELECTRODES

William A. Hart, Allentown, and James J. Klinikowski, Whitehall, both of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 18, 1977, Ser. No. 816,611

Int. Cl.[2] G08B *1/00*

U.S. Cl. 340—309.1 **7 Claims**



1. In a coulometric electrolytic timing device adapted for use in electrical circuits for detecting the rupture of a circuit conductive path after a predetermined time period, said rupture caused by the electroplating away of an electrode in said conductive path the improvement which comprises:

(a) an electrically conductive cylindrical sleeve,

(b) an electrically conductive, solid, cylindrical rod coaxially aligned and disposed within said sleeve,

(c) nonconductive support means for engaging said rod and maintaining said rod in coaxial alignment within said sleeve;

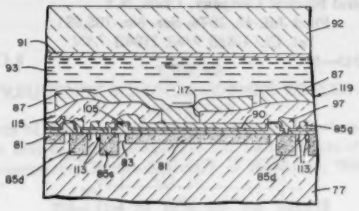
(d) an electrolyte disposed between said rod and said sleeve;

(e) sealing means for retaining said electrolyte within said sleeve.

4,103,297
LIGHT-INSENSITIVE MATRIX ADDRESSED LIQUID CRYSTAL DISPLAY SYSTEM

Denis J. McGreivy, Laguna Beach; Henry T. Peterson, Irvine, and Alex M. Leupp, Costa Mesa, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1976, Ser. No. 752,037
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 M 8 Claims

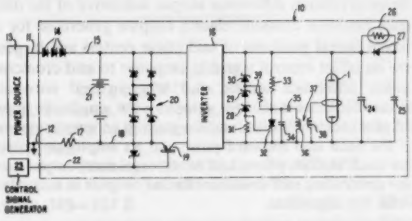


1. A liquid crystal display panel for providing a pictorial display comprising in combination:
(a) a semiconductor backplate having a major surface;
(b) a doped layer extending along said surface, said layer having an array of openings arranged in a plurality of columns and rows;
(c) a switching device formed in said semiconductor backplate surface entirely within each said opening;
(d) a coplanar array of closely spaced, reflective back electrodes, each extending entirely over a respective one of said openings;
(e) means for electrically connecting each of said switching devices to the back electrode extending over it;
(f) a transparent front electrode spaced from said coplanar array of back electrodes;
(g) liquid crystal material confined between said front and back electrodes; and
(h) means for applying an actuating voltage between selected ones of said back electrodes and said front electrode through said switching devices.

4,103,298
ALARM DEVICE

Robert J. Redding, Maidenhead, England, assignor to Browne-Davies Electronic Corporation, Houston, Tex.

Filed Jul. 20, 1976, Ser. No. 707,110
Int. Cl.[2] H05B 41/00
U.S. Cl. 340—331 11 Claims

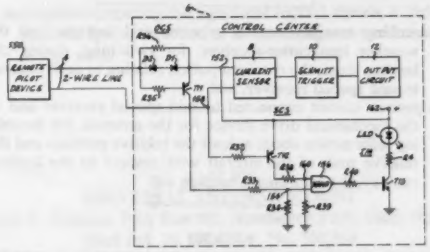


1. An intrinsically safe strobe system comprising,
a high voltage strobe unit comprising,
a gas flash tube having a trigger circuit, a capacitor connected in series with the flash tube, a charging power supply whose output is connected in parallel with the flash tube and capable of charging the capacitor to a potential sufficient to ionize the gas in the flash tube and whose input is low voltage, low current intrinsically safe power;
said strobe unit being contained in an intrinsically safe enclosure in a hazardous area;
an intrinsically safe power supply located in a safe area whose intrinsically safe power output is electrically connected to the input of said charging power supply in said hazardous area, and
triggering means in said enclosure connected to said flash tube's trigger circuit for controllably allowing an electrical signal having an intrinsically safe power level to actuate the flash tube.

4,103,299
TWO-WIRE PILOT DEVICE SOLID STATE CONTROL SYSTEM

Merle R. Swinehart, Brookfield, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 12, 1976, Ser. No. 731,509
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—506 12 Claims



1. A solid state pilot system comprising:
a remote station comprising pilot means operable to provide a change in current level from a first level to a second level in response to operation thereof;
a control center comprising current sensor means;
a two-wire line connecting said pilot means to said current sensor means;
solid state means in said current sensor means for providing a change in control voltage value in response to said change in current level;
a solid state voltage level sensor responsive to said change in control voltage value for providing a switched output signal;
and means responsive to said switched output signal for operating a load device;
said solid state means in said current sensor means comprising a transistor and means biasing said transistor for conduction;
and said two-wire line being connected in the collector circuit of said transistor thereby to cause a change in conduction in response to said change in current level.

4,103,300
AIR NAVIGATION AND LANDING AID SYSTEM

Robert Gendreu, and Maurice Chabah, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,686
Claims priority, application France, Dec. 14, 1973, 73 44802; Mar. 28, 1974, 74 10898
Int. Cl.[2] G01S 9/56, 9/60
U.S. Cl. 343—6 R 18 Claims

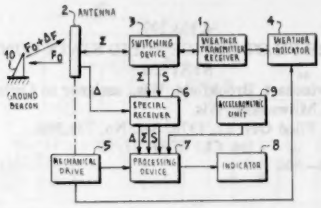
1. An air navigation and landing aid system comprising on the ground: at least one transponder beacon for receiving pulses having a predetermined frequency and retransmitting said pulses with at least one frequency which is different from said predetermined frequency, each beacon being located at a predetermined position with respect to a landing runway, and in an aircraft;

an antenna;

a mechanical drive device for the antenna;

a weather transmitter-receiver coupled to the antenna, for emitting pulses at said predetermined frequency, for receiving echo signals having said predetermined frequency in response to said emitted pulses and for furnishing information affording a navigation aid during the flight stage;

a special receiver for receiving the pulses re-transmitted by each beacon in response to the interrogation of the weather transmitter during the landing stage;



switching means, inserted between said antenna and the weather transmitter-receiver, for switching, during the landing stage, the received pulses, relating to each beacon, to said special receiver, and

a process circuit connected to said special receiver and to the mechanical drive device for the antenna, for furnishing information about at least the relative position and the relative path of the aircraft with respect to the landing runway, for affording a landing aid.

4,103,301

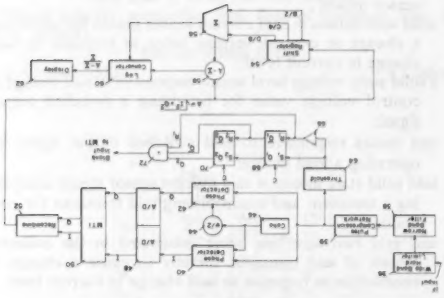
CONSTANT FALSE ALARM RATE MOVING TARGET INDICATION RADAR SYSTEM (CFAR-MTI)

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 20, 1975, Ser. No. 588,577

Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7 **21 Claims**



1. A constant false alarm rate, moving target indicator radar system comprising in combination:

a recombining network responsive to both in-phase and quadrature signal outputs from a moving target indicator and forming therefrom output signal functionally related to said in-phase and quadrature signals;

a shift register responsive to output signal from the recombining network and forming functionally related output signals therefrom;

a summing circuit responsive to output signals developed in the shift register and forming a functionally related output signal therefrom;

a substractor circuit responsive to output signals from the summing circuit and the recombining network and forming a functionally related output signal therefrom;

a log converter circuit responsive to output signal from said summing circuit and said subtractor circuit and furnishing input signals functionally related thereto to display processing elements of the radar system.

4,103,302

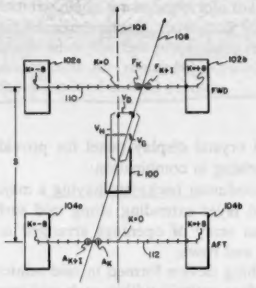
VELOCITY AND DRIFT ANGLE TRACKING SYSTEM USING ALTIMETRY SIGNALS

Allan W. Roeder, Whitesboro; Richard M. Kimball, and Richard F. Koschmeder, both of New Hartford, all of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Jul. 16, 1976, Ser. No. 705,881

Int. Cl.² G01S 9/48; H04B 7/04

U.S. Cl. 343—9 **8 Claims**



1. A system for determining the drift angle of a fluid-born vehicle, said drift angle being defined as the angle between the vehicle heading direction and the direction said vehicle is moving relative to an adjacent stationary reflecting surface, said system comprising, in combination:

transmitting means provided on said vehicle for illuminating said surface with a train of wave energy pulses;

receiving means on said vehicle for receiving said wave energy after reflection from said surface, said receiving means having forward and aft energy-receiving phase centers spaced apart from one another in said vehicle heading direction;

offset means for electronically intermittantly shifting said forward and aft phase centers by selected amounts in directions lateral to said heading direction;

correlating means responsive to reflected wave energy pulses received at said forward and aft phase centers for processing selected pairs of said forward and aft received pulses to generate a crosscorrelation output indicative of the crosscorrelation of a plurality of said selected pairs, said correlating means further operating to generate a crosscorrelation difference output indicative of the difference between crosscorrelation outputs generated for different lateral positions of said phase centers and to generate an offset control signal in response to said crosscorrelation difference output, and wherein said correlating means includes means for sampling the amplitude of each of said received pulses and for storing an amplitude value F for each said forward pulse and an amplitude value A for each said aft pulse; and crosscorrelation output means for generating said crosscorrelation outputs in accordance with the algorithm

$$\rho FA = \frac{E\{FA\} - \eta F\,\eta A}{\sigma F\,\sigma A}$$

where E {FA} represents the expected value of the products of said amplitude values for a predetermined number of said selected pairs of pulses; $\eta_F\,\eta_A$ represents the product of the mean values for the F and A values, respectively, in said predetermined number of selected pairs of pulses and $\sigma_F\,\sigma_A$ represents the product of the standard deviation values for the F and

A values, respectively, in said predetermined number of selected pairs of pulses;

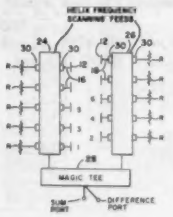
electronic control means responsive to said offset control signal for controlling said offset means to alter the amount of lateral displacement of said phase centers so as to minimize said crosscorrelation difference output; and

calculating means responsive to the amount of said phase center displacement for generating a representation of drift angle.

4,103,303
FREQUENCY SCANNED CORNER REFLECTOR ANTENNA

Kenneth M. Regenos, Palo Alto, and Normand Barbano, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1976, Ser. No. 735,478
Int. Cl.² H01Q *3/26, 19/16*
U.S. Cl. 343—100 SA **5 Claims**



1. A frequency scanned corner reflector antenna comprising: first and second planar microwave reflector surfaces disposed for forming a throat at an acute angle therebetween, a plurality of dipole antennas uniformly disposed in columns in said throat for radiating and receiving microwave energy, a first helix frequency scanning feed coupled to a first portion of said dipole antennas for coupling microwave energy thereto, a second helix frequency scanning feed coupled to a second portion of said dipole antennas for coupling microwave energy thereto, signal dividing means coupled to both of said helix feeds for simultaneously coupling microwave energy to and from said feeds for providing antenna frequency scanning in a clockwise or a counterclockwise direction when input signal frequency is increased or decreased respectively.

4,103,304
DIRECTION LOCATING SYSTEM

Fred E. Burnham, Silver Spring, and William H. Clark, College Park, both of Md., assignors to Litton Systems, Inc., College Park, Md.

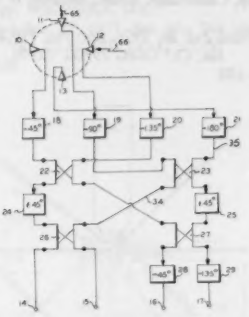
Filed Apr. 20, 1973, Ser. No. 352,892
Int. Cl.² G01S *3/48*
U.S. Cl. 343—113 R **16 Claims**

1. In an instantaneous direction finding system for determining the spatial direction of an incoming wave,

an arcuately disposed antenna array of elements for observing over an extended arc in space,

a network means having plural outputs, and plural inputs continuously coupled to plural elements of said array to provide at one of the outputs a progressively different time phase displaced signal for each different spatial direction of an incoming wave,

said network providing at a different output a second signal that differs in time phase from that produced for each different spatial direction of the wave,

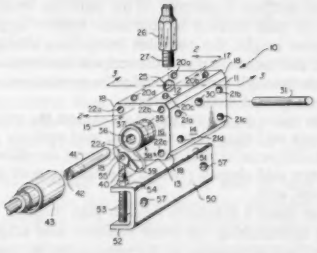


and means comparing the signal and second signals, to determine the spatial direction of an incoming wave referenced to said array.

4,103,305
UNIVERSAL ANTENNA MOUNT

Emil V. Gualano, P.O. Box 902, Huntington Park, Calif. 90255

Filed Jul. 26, 1976, Ser. No. 708,383
Int. Cl.² H01Q *1/32, 1/12*
U.S. Cl. 343—715 **16 Claims**



1. A mount for an antenna or the like comprising:

a body in the form of a substantially rectangular block, said block being formed of an electrically insulative material having a first pair of opposed surfaces forming the top and bottom of the block, respectively, said first opposed surfaces including flat substantially parallel portions, and a second pair of opposed surfaces forming lateral sides of the block and having opposed flat substantially parallel portions which are essentially perpendicular to the first said pair of opposed flat parallel portions,

apertures in said block in at least one of said pairs of flat substantially parallel portions for receiving means for mounting said block,

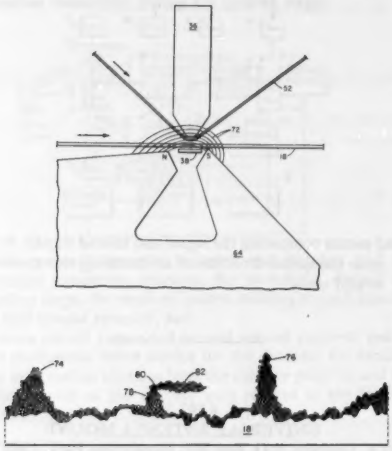
a first opening in the top of the block forming a first passageway into the block and including means for receiving an antenna base,

and a second opening extending into a second surface of the block and forming a second passageway intersecting the first passageway, a nipple associated with the second opening for receiving an antenna wire coupling, and means in the second passageway for communicating a signal from the antenna base to the antenna wire.

4,103,306
NON-IMPACT PRINTER WITH MAGNETIC INK REORIENTATION

Roger E. Clapp, Cambridge, Mass., assignor to Epp Corp., Boston, Mass.

Filed Jul. 30, 1976, Ser. No. 710,281
Int. Cl.[2] G03G *19/00, 15/06*
U.S. Cl. 346—153 17 Claims



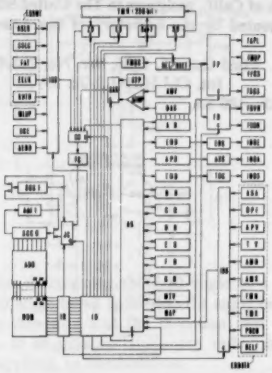
1. Printing means comprising, in combination,
a print electrode having a shaped portion for printing,
an ink source comprising a support with a surface facing said shaped portion, a quantity of ink particles loosely distributed on said surface in mutually spaced aggregates of irregular height, the particles comprising a magnetic material, and means to move the support to cause said surface to pass through a print position in predetermined spaced relation to said shaped portion,
means to move an ink recipient sheet past the print position between said shaped portion and said surface,
means to cause an electrical field of short duration to extend between said shaped portion and the support at the print position, and
means to cause a magnetic field to pass through the aggregates approaching the print position, said magnetic field being fixed in relation to the print position, having a substantial component perpendicular to the direction of the electrical field at said print position, and being of sufficient strength to reorient a number of said aggregates.

4,103,307
EXPOSURE CONTROL DEVICE

Nobuhiko Shinoda, Tokyo; Tadashi Ito, Yokohama; Soichi Nakamoto, Machida, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 611,806, Sep. 9, 1975, which is a continuation of Ser. No. 488,849, Jul. 15, 1974. This application May 23, 1977, Ser. No. 799,568
Claims priority, application Japan, Jul. 16, 1973, 48-80087; Aug. 27, 1973, 48-95916; Aug. 28, 1973, 48-96502
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—23 D 97 Claims

1. An exposure control device for a camera comprising:
(a) exposure information means for entering exposure information values into the exposure control device;
(b) first control means having a plurality of actuating means for controlling a plurality of individual camera elements including a shutter screen;
(c) a sequence control circuit means having at least one input terminal and at least one output terminal to supply first control signals for controlling said actuating means, wherein the sequence control circuit means produces in sequence from the output terminal control signals which correspond to the input values applied to the input terminal, said actuating means being thereby selectively driven corresponding to the first control signals;
(d) a calculating circuit connected to said exposure information means and to said sequence control circuit means and responsive to the sequential control signals from the sequence control circuit means, wherein the calculating circuit has at least one output terminal and automatically performs a mathemetical calculation employing the adjusted exposure information values from exposure information means to determine various values in relation with the control signals;

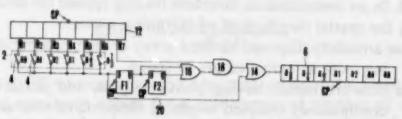


(e) a second control means connected to the output terminal of said calculating circuit and to the input terminal of said sequence control circuit means, wherein the second control means applies second control signals which correspond to the values determined by the calculating means to the sequence control circuit means so that control signals which correspond to the values determined by the calculating circuit are generated from the sequence control circuit means; and
(f) means for entering instantaneous values representing operating conditions of various individual camera elements of said first control means into said sequence control circuit means.

4,103,308
DIGITAL INFORMATION INPUT METHOD

Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Hino; Nobuhiko Shinoda, Tokyo; Tadashi Ito, Yokohama; Hiroyashu Murakami, Tokyo, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,908
Claims priority, application Japan, Apr. 30, 1975, 50-53043
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—23 D 4 Claims



1. A digital information input circuit arrangement comprising:
a plural number of switches arranged parallel to each other

so as to be selectively opened and closed, said plural number of switches including a first switch corresponding to the weight $\frac{4}{7}$ in APEX value and a second switch corresponding to the weight $\frac{1}{7}$ in APEX value;

an *n* bit register, said register including a first bit with the weight $\frac{4}{7}$ in APEX value, a second bit with the weight $\frac{1}{7}$ in APEX value and a third bit with the weight $\frac{1}{7}$ in APEX value;

a signal producing means being connected to the plural number of switches so as to produce closing signals by means of the selective closing of the plural number of switches to be transferred to the register, and

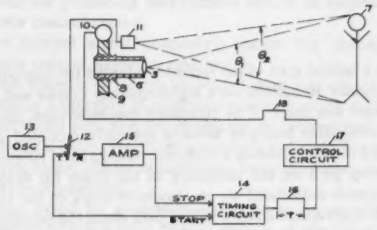
a transfer means from transferring to the register the closing signals due to the closing of the plural number of switches, said means including a first transfer means for transferring the closing signal of the first switch to the first bit, the closing signal of the second switch to the second bit and the closing signal of the first and the second switch to the third bit.

4,103,309

AUTOMATIC CAMERA FOCUSING MEANS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust

Filed May 11, 1976, Ser. No. 685,429
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—25 **2 Claims**



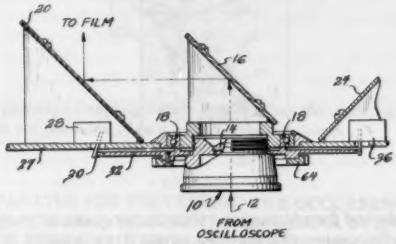
1. In combination in a photographic camera, a lens characterized in that its field of view is defined by the angle θ_1, a directional electroacoustic transducer characterized in that its main beam angle is defined by the angle θ_2, means for attaching said transducer to said camera with the axis of maximum sensitivity of said transducer mounted parallel to the axis of said lens, said transducer further characterized in that its beam angle θ_2 is not greater than θ_1, a first electrical circuit means for operating said electroacoustic transducer as an echo-ranging system and generating a first reference electrical signal which varies as a function of the distance between the transducer and the subject toward which the lens is facing, a second electrical circuit means for generating a second reference electrical signal which varies as a function of the focus setting position of the lens, automatic focus-adjusting means including an electrically-operated drive system adapted for adjusting the position of said lens, control signal means for operating said automatic focus-adjusting means, means for continually comparing said first and said second reference signals, said signal comparison means characterized in that said control signal is generated whenever said first and said second reference signals are not equal, said electrically-operated drive system characterized in that it is responsive to said control signal, whereby said electrically-operated drive system is activated to adjust the position of said lens until said first and second reference signals are equal, whereby said lens is automatically kept in focus on the subject toward which the lens is facing, and further characterized in that the beam angle of said electroacoustic transducer lies within the approximate range 10° to 30°.

4,103,310

MULTIPLE-IMAGE OSCILLOSCOPE CAMERA

Nicholas J. Yasillo, Tinley Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,166
Int. Cl.[2] G03B 29/00, 35/00
U.S. Cl. 354—120 **3 Claims**



1. An apparatus for placing on a single photographic film a plurality of images of discreet views of displays of an oscilloscope, the apparatus comprising:

an enclosing frame connected to the oscilloscope and adapted to receive and hold the film and forming therewith a light-tight inner region;

a lens mounted within the inner region and coupled optically to the oscilloscope display to focus light therefrom;

a rotating mirror disposed within the inner region and coupled optically to the oscilloscope display and the lens to reflect light from the display at an angle of approximately 90°;

a plurality of fixed mirrors, each one of said plurality mounted within the inner region and disposed to reflect the light reflected by the rotating mirror in one of a plurality of predetermined positions to a predetermined location on the film, the distance of light travel from the lens to the rotating mirror, to each fixed mirror and to the film being chosen to focus light from the display on the film;

a bearing connected to the enclosing frame and to the rotating mirror to permit rotation of the mirror with respect to the enclosing frame;

a stepping motor connected to the rotating mirror to rotate the rotating mirror to one of a plurality of predetermined positions;

a switch actuator coupled mechanically to the rotating mirror and responsive to the position thereof;

a plurality of switches equal in number to the plurality of fixed mirrors, each of the switches disposed to respond to the switch actuator to provide a signal indicating position of the rotating mirror;

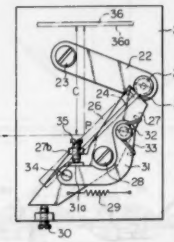
means for producing a signal to start rotation of the mirror; and

an electronic circuit connected to the plurality of switches, to the means for producing a signal to start rotation, and to the stepping motor to start the stepping motor in response to a signal from the means for producing a signal and to stop the stepping motor in response to a signal from any one of the plurality of switches.

4,103,311
METHOD AND APPARATUS FOR ADJUSTING THE VIEW FINDER OF A SINGLE-LENS REFLEX CAMERA

Hirofumi Horigome, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,970
Claims priority, application Japan, May 10, 1976, 51-52185
Int. Cl.[2] G03B *19/12*
U.S. Cl. 354—152 5 Claims



1. Method for adjusting the view finder system of a single-lens reflex camera characterized in that it comprises:

providing a mirror frame having upper and lower arms jointed together, the free end of said upper arm being rotatably fixed to the mirror box, said lower arm bearing the swingable mirror;

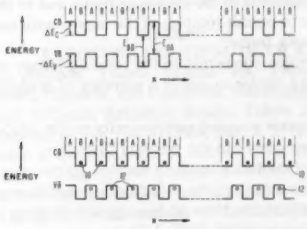
adjusting the position of said lower arm so as to set the swingable mirror at an angle of 45° with respect to the optical axis of the taking lens; and

raising or lowering the joint between said upper and lower arms of said mirror frame and at the same time raising or lowering the free end of said lower arm so as to translate the swingable mirror with respect to the focusing screen, whereby the optical distance from the taking lens to the focusing screen via the swingable mirror is adjusted.

4,103,312
SEMICONDUCTOR MEMORY DEVICES

Leroy Ligong Chang, Mohegan Lake; Leo Esaki, Chappaqua, and George Anthony Sai-Halasz, Mohegan Lake, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,068
Int. Cl.[2] H01L *29/161*
U.S. Cl. 357—16 50 Claims



1. A semiconductor storage device, comprising:

semiconductor means for producing spatially separated potential wells for electrons and holes,

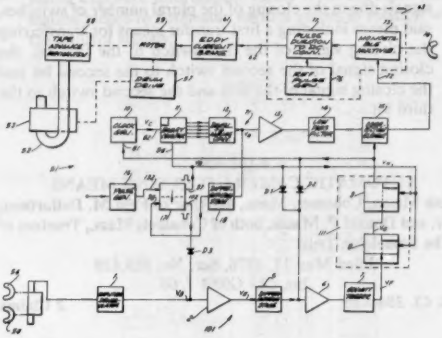
write means for generating electrons and holes in said wells, and

read means for detecting the presence of said electrons and holes in said wells.

4,103,313
CIRCUIT FOR THE AUTOMATIC SCANNING ADJUSTMENT OF A VIDEO TAPE IN A VIDEO RECORDER

Egon Frank, Theisenort, Fed. Rep. of Germany, assignor to Loewe-Opta GmbH, Kronach, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,870
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549579
Int. Cl.[2] G11B *21/10*
U.S. Cl. 360—70 9 Claims

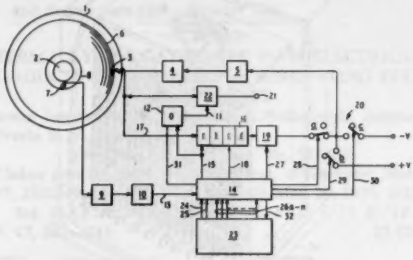


1. In a helical scan video recorder adapted for reproducing video signals modulated on a highfrequency carrier and fixed on at least one track of an elongated magnetic tape, the tape being wrappable helically about a rotatably mounted drum, detecting means including a magnetic pick-up head rotatable in a scanning path on the periphery of the drum for detecting video signals modulated on an associated track of the tape as the tape is advanced along a helical path about the periphery of said drum, means for longitudinally advancing the tape, means responsive to the detecting means for generating a tracking control signal, and tape velocity regulation means coupled to the output of the tracking control signal generating means and cooperable with the tape advancing means for varying the velocity of advance of the tape in accordance with variations of the tracking control signal to correspondingly vary the amplitude of the detected video signal, the improvement wherein the tracking control signal generating means comprises, in combination, clock pulse generating means cyclically operable with a first repetition interval and having a first control input, the clock pulse generating means being disabled upon the application of a pulse to the first control input, resettable stepping means coupled to the output of the clock pulse generating means for normally generating, as the tracking control voltage, a repetitive DC staircase voltage over a second repetition interval long with respect to the first interval while the clock pulse generating means remains enabled, the staircase voltage normally progressing from a first relatively low level to a second relatively high level in increments determined by the first repetition interval and the dropping abruptly from the second level to the first level at the end of the second repetition interval, the stepping means being adapted to store the staircase voltage level attained at the instant that the clock pulse generating means is disabled, pulse forming means coupled to the output of the detecting means and responsive to the successive passage of the detected video pulse amplitude through a minimum and a following maximum during the second interval for generating a stop pulse, and means for coupling the output of the stop pulse generating means to the first control input of the clock pulse generating means.

4,103,314
MOTION CONTROL SYSTEM

William John Philip Case, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,566
Claims priority, application United Kingdom, Jun. 30, 1976, 27317/76
Int. Cl.[2] G11B *21/08, 21/10;* G05B *19/24*
U.S. Cl. 360—78 13 Claims



1. A motion control system for controlling relative motion between two objects along a predetermined path of travel according to a predetermined nominal velocity profile, said system comprising:

a motor for producing said relative motion in response to motor control signals;

motor control signal connecting means for connecting motor control signals to said motor;

position transducer means, associated with said objects, for defining a plurality of reference positions along said predetermined path and for producing an incremental position signal indicative of the magnitude and direction of the displacement of said objects from successive ones of said reference positions;

a timing means for generating timing signals nominally indicative of the arrival of said objects at predetermined ones of said reference positions when moving according to said predetermined nominal velocity profile;

sampling means responsive to said timing signals to generate sample values of said incremental position signal representative of any error between the actual position of said objects and said predetermined reference positions;

feedback signal deriving means for deriving a feedback signal from said sample values of said incremental position signal and for providing said feedback signal to said connecting means as a motor control signal.

4,103,315
ANTIFERROMAGNETIC-FERROMAGNETIC EXCHANGE BIAS FILMS

Robert Douglas Hempstead, Morgan Hill, Calif.; Sol Krongelb, Katonah, N.Y.; Daniel Andrew Nepela, Saratoga, Calif.; David Allen Thompson, Somers, N.Y., and Erich Philipp Valstyn, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

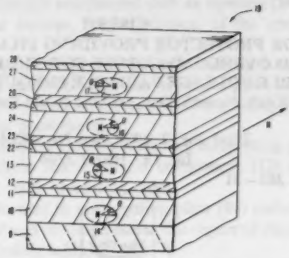
Filed Jun. 24, 1977, Ser. No. 809,598
Int. Cl.[2] G11B *5/12, 5/30*
U.S. Cl. 360—110 53 Claims

1. A magnetic thin film structure including a sandwich composed of layers including

a first layer comprising a ferromagnetic material in direct atomic contact with a second layer of an antiferromagnetic material,

said first layer having a coercivity of less than about 10 Oersteds

and a unidirectional magnetic bias sustained by an exchange interaction relationship with said second layer provided by alignment of spins in said antiferromagnetic material, and

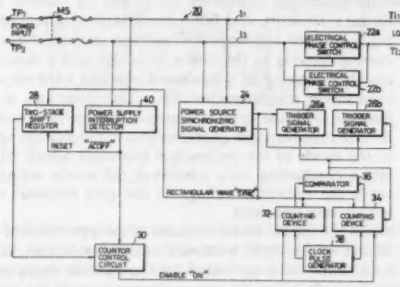


an exchange coupling field H_e greater than the coercivity H_c in the presence of said exchange interaction.

4,103,316
APPARATUS FOR PREVENTING THE OCCURRENCE OF POSSIBLE TRANSIENT PHENOMENA IN AN ELECTRIC POWER TRANSMISSION CIRCUIT

Yoshiaki Kaneko, Kawasaki, Japan, assignor to Sanki Denshi Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed May 12, 1977, Ser. No. 796,484
Int. Cl.[2] H01H *33/59*
U.S. Cl. 361—3 12 Claims



1. Apparatus for preventing occurrence of possible transient phenomena in a circuit including an alternating current power source and a load connected thereto when the supply of electric power from said power source to said load, which has been interrupted, is restarted, said apparatus comprising:

(a) switching means provided in said circuit between said power source and said load;

(b) means for generating trigger signals to operate said switching means in synchronization with the voltage or current of said power source for supplying power from said power source to said load in a smooth manner;

(c) means for detecting a possible occurrence of interruption of the power supply;

(d) means responsive to the detecting of the interruption of the power supply by said detecting means for memorizing the phase angle of the current or voltage of said power source at the time of the occurrence of the interruption of the power supply to stop the operation of said trigger signal generating means and to turn off said switching means; and

(e) means for detecting the coincidence of the phase angle memorized in said memorizing means with a changing phase angle of the voltage or current of said power source after the power supply from said power source to said load becomes again possible to restart the operation of said

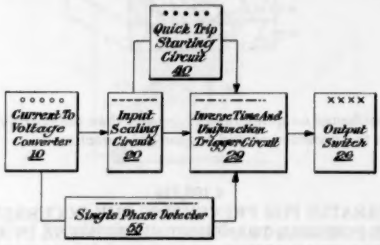
trigger signal generating means and therefore said switching means at the time of detecting the coincidence.

4,103,317

MOTOR PROTECTOR PROVIDING PHASE FAILURE AND OVERLOAD CUTOFF FOR THREE-PHASE VARIABLE VOLTAGE VARIABLE FREQUENCY MOTOR

John B. Krick, Newark, Del., assignor to Val Tech Inc., Newark, Del.

Filed Jun. 7, 1976, Ser. No. 693,421
Int. Cl.[2] H02H 3/08
U.S. Cl. 361—31 **6 Claims**


Quick Trip Starting Circuit 40
Current To Voltage Converter 10
Input Scaling Circuit 20
Inverse Time And Unijunction Trigger Circuit 29
Output Switch 26
Single Phase Detector 28

1. A circuit for protecting motor windings of a 3-phase motor with a unijunction transistor energized by a DC voltage to activate an interruption of the operation of the motor, wherein the motor has a continuous motor rating which comprises

current-to-voltage converter comprised of current transformers, resistors, and full-wave bridge rectifiers providing a rectified full-wave DC voltage proportional to the current flowing in the motor windings and a time delay circuit consisting of a Resistor-Capacitor network and a unijunction transistor detector which functions in conjunction with the current sensitive voltage to provide an inverse time response characteristic to the voltage applied to the anode of the unijunction transistor which triggers into a conducting state whenever the anode voltage exceeds the reference voltage in the gate terminal of the unijunction transistor,

wherein the improvement consists of incorporation of a fast timing inrush timer with said time delay circuit, said inrush timer being activated by the current sensitive DC voltage whenever the motor current exceeds the continuous motor rating by a predetermined percentage to charge said timing capacitor in accordance with said current sensitive voltage,

and including means for adjusting the elapsed time period within which said DC voltage sensitive to said excessive motor current provides the charge to said capacitor.

4,103,318

ELECTRONIC MULTICHIP MODULE

Otto G. Schwede, Los Altos, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 6, 1977, Ser. No. 794,586
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—388 **4 Claims**

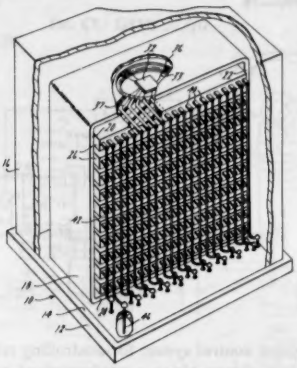
1. An electronic multichip module, which comprises, in combination:

a metallic base member;

a metallic cover hermetically sealed to said base member, said base member and said cover together forming an enclosure;

at least one metallic support member within said enclosure and attached thereto;

a plurality of integrated circuit units, each of said units comprising: a metal plate supported by said support member and in heat conductive relation with said support member; an integrated circuit chip mounted on said metal plate to permit heat transfer from said integrated circuit chip to said metal plate; an insulator on said metal plate; a plurality of electrically-conductive elements insulated from said metal plate by said insulator and having terminal portions extending beyond said insulator and metal plate, said conductive elements being electrically isolated from said metal plate by said insulator; and means for electrically connecting said conductive elements to said integrated circuit chip;



means for electrically interconnecting said terminal portions of said conductive elements of said integrated circuit units; and

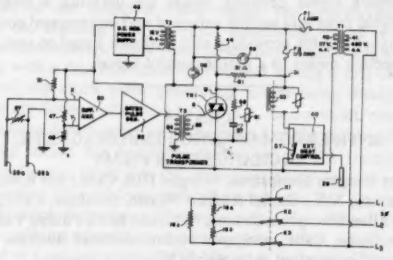
electrically conductive means, extending through said enclosure and electrically isolated thereform, for permitting electrical connection of circuitry external of said enclosure to be made to said means for electrically interconnecting said terminal portions of said conductive elements of said integrated circuit units.

4,103,319

HAZARD PREVENTION CIRCUIT FOR IMMERSION HEATERS

N. Robert Crain, Huntington Beach; Joseph S. Romance, Diamond Bar, and Carson T. Richert, Buena Park, all of Calif., assignors to Radiant Technology Corporation, Cerritos, Calif.

Filed Jun. 27, 1977, Ser. No. 810,183
Int. Cl.[2] H02H 5/04
U.S. Cl. 361—106 **10 Claims**



1. A hazard prevention control circuit for an immersion heater having heating elements enclosed in an envelope immersed in a tank of solution to be heated, said control circuit comprising:

a circuit breaker;

a contactor having a contactor coil and a set of contacts for connecting an a.c. supply to said heating elements;

power supply means connected to supply current through said circuit breaker to energize said contactor coil;

a load circuit including a normally non-conducting thyristor

having a gate input, said load circuit connected in parallel with said contactor coil;

a sensing circuit including sensing means responsive to a malfunctioning of said immersion heater to generate an a.c. signal;

a power transformer coupled to said power supply means to supply power for operating said sensing circuit; and

a pulse transformer for coupling said a.c. signal to the gate input of said thyristor to thereby draw an excess current through said load circuit which blows said circuit breaker and deenergizes said contactor coil.

4,103,320

THERMALLY INSULATED PIPE WITH ELECTRICALLY CONDUCTING PORTIONS FOR DISSIPATING STATIC ELECTRICITY

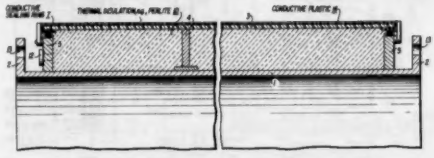
Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B. V., Zwolle, Netherlands

Filed Nov. 22, 1976, Ser. No. 743,658

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552349; Mar. 20, 1976, 2611848; Mar. 20, 1976, 2611849

Int. Cl.[2] F16L *11/12;* **H05F** *3/02;* **F16L** *9/14, 59/14*

U.S. Cl. 361—215 **17 Claims**



1. A thermally insulated pipe, in particular a pipe for mining industries, comprising a plastic outer pipe and an inner pipe, the pipes being concentrically positioned with respect to each other, and a thermally insulating layer of heat resistant material between the inner and the outer pipe, said outer pipe having an electrically conductive outer surface layer which is electrically conductively connected with the inner pipe.

4,103,321

COMPOSITE ELECTRIC CIRCUIT STRUCTURE OF A PRINTED CIRCUIT AND HEAT GENERATING DISCRETE ELECTRICAL COMPONENT

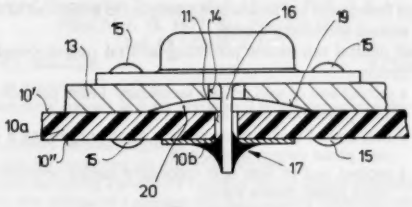
Willi Gansert, Kornwestheim, and Martin Zipperer, Hildesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,669

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1976, 2601035

Int. Cl.[2] H05K *7/20*

U.S. Cl. 361—388 **4 Claims**



1. Composite electric circuit structure comprising

a printed circuit (**10**) having a substrate plate (**10***a*) of insulating material, formed with an opening (**11**) therethrough;

a conductive layer or coating (**10***b*) on at least one surface (**10″**) of said substrate plate;

a discrete electrical component (**12**) located at the side of the other surface (**10′**) of the substrate (**10***a*) plate and having a connecting pin (**16**) passing through said opening (**11**);

a cooling plate (**13**) located between the other substrate plate surface (**10′**) and the electrical component (**12**) to dissipate heat generated in said component during passage of current therethrough and formed with an opening (**14**) therethrough for passage, with clearance, of the connecting pin;

attachment means (**15**) passing through said component (**12**), the cooling plate (**13**) and the substrate plate (**10***a*) and clamping the electrical component, the cooling plate and the substrate plate together;

a solder connection (**17**) between the connecting pin (**16**) extending from the electrical component (**12**) and the conductive layer or coating (**10***b*);

a relief (**19**) formed in said cooling plate (**13**) reducing the thickness of said cooling plate in the region of the opening (**14**) surrounding said pin (**16**),

extending in the direction of the pin (**16**) and laterally thereof beneath the electrical component and located between the other surface (**10′**) of the substrate plate (**10***a*) and the surface of the electrical component (**12**) facing said other surface (**10′**) to form a chamber between said other surface (**10′**) of the substrate plate (**10***a*) and the facing surface of the cooling plate (**13**).

4,103,322

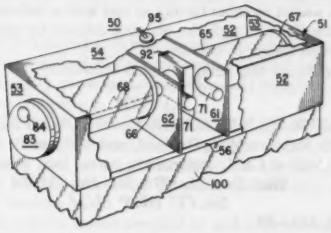
LIGHTING DEVICE

Gerald Price Thompson, 3509 W. Lyndale, Chicago, Ill. 60647

Filed Sep. 27, 1976, Ser. No. 727,258

Int. Cl.[2] F21V *33/00, 29/00*

U.S. Cl. 362—101 **3 Claims**



1. A device providing single color lighting to a fish tank or the like, said device comprising a cylindrical enclosure containing a light source and having an angular air inlet tube at one end thereof and an air outlet at the other end thereof, each of said air inlet and outlet being constructed to restrict light from entering said enclosure with said air outlet being at an elevation higher than said air inlet, masking means for restricting the escape of light from said enclosure to a predetermined area and for absorbing reflected or refracted light, filter means having an area at least as large as said predetermined area associated with said masking means that said light escaping said enclosure passes through said filter means, and means for mounting said enclosure on the top of a fish tank or the like with said predetermined area in registry with the top of the tank, whereby activation of said light source results in light having a single color corresponding to the color of said filter means shining into the fish tank to provide a color effect to water contained therein without reflected or refracted light comingling with said single color to alter same.

4,103,323

LAMP WITH RESILIENT RETAINER RING

Karel Urbanek, Weston, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada

Division of Ser. No. 724,522, Sep. 20, 1976. This application Aug. 11, 1977, Ser. No. 823,747

Int. Cl.[2] F21V *7/00*

U.S. Cl. 362—306 **24 Claims**

1. In a lamp, the combination comprising

a housing having a hollow portion,

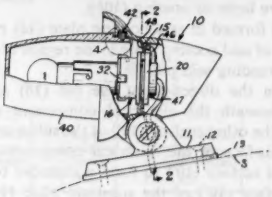
a bracket engaging the interior of said hollow portion of said housing,

said bracket having an opening therein,

a shock mounting member extending through said opening,

said member being made of resilient material and having spaced annular flanges extending along opposite sides of said retainer and forming a groove in which said retainer is positioned,

means in said groove extending axially and engaging one surface of said retainer for holding the opposite surface of said retainer against said opposite flange,



said shock mounting member having an axially extending opening therein,

a socket retainer having a planar surface engaging said inwardly turned flange of said spacer and the end of said shock mounting member,

said socket retainer having portions thereof crimped into engagement with the periphery of said shock mounting member,

and a socket member having an end with a reduced diameter extending through the opening defined by said inwardly turned flange of said spacer,

said reduced end being crimped outwardly.

4,103,324

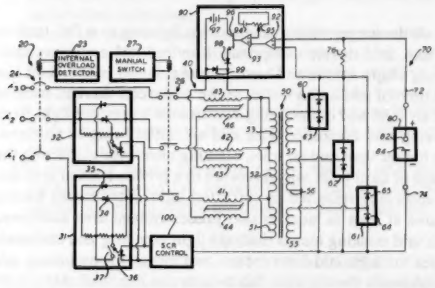
SATURABLE REACTOR-TYPE POWER SUPPLY

C. Keith Vandervelden, Oakland, and William P. Blake, Palo Alto, both of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Dec. 22, 1976, Ser. No. 753,404

Int. Cl.[2] H02P *13/24*

U.S. Cl. 363—89 **16 Claims**



1. A power supply which is operated from a source of three-phase alternating input current and which provides a direct current output to an external load, comprising:

first, second, and third saturable reactors, each comprising a current winding and a control winding;

first pair of opposed semiconductor controlled rectifiers connected in series with the current winding of the first saturable reactor;

second pair of opposed semiconductor controlled rectifiers connected in series with the current winding of the second saturable reactor;

a transformer comprising three primary windings connected to the current windings of the three saturable reactors, and three secondary windings;

a rectification means connected to the three secondary windings of the transformer for obtaining direct current;

first control circuit for establishing normal output current of the power supply by providing an adjustable control current to the control windings of the saturable reactors;

second control circuit for monitoring an operating parameter of the external load and for altering the firing of the semiconductor controlled rectifiers to change the output current in response to a change in the operating parameter.

4,103,325

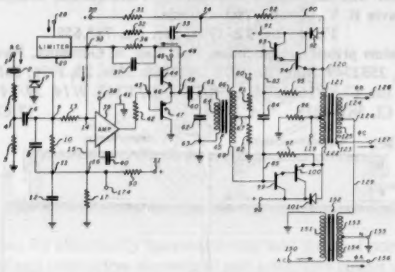
AIRCRAFT POWER AND PHASE CONVERTER

Charles E. Hyman, and Alfred C. Setter, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,214

Int. Cl.[2] H02M *5/293*

U.S. Cl. 363—148 **7 Claims**



1. Power conversion apparatus adapted to be responsive jointly to aircraft single-phase alternating current power supply means and to aircraft direct current power supply means for generating three-phase alternating current aboard an aircraft of substantially greater power level than the power level of said aircraft single-phase power supply means, comprising:

network means for shifting the phase of said single phase alternating current by substantially 90°,

first amplifier means having an input responsive to said network means,

push-pull power amplifier means responsive to said first amplifier means,

first transformer means having first primary and first secondary means,

said first primary means being responsive to said push-pull power amplifier means,

said first secondary means having first center tap means,

second transformer means having second primary and second secondary means,

said second primary means being responsive to said single phase alternating current,

said second secondary means having neutral tap means,

said first center tap means being coupled to a first end of said second secondary means,

said neutral tap means providing neutral output coupling means,

a second end of said second secondary means providing a first phase output signal,

a first end of said first secondary means providing a second phase output signal, and

a second end of said first secondary means providing a third phase output signal.

4,103,326

TIME-SLICING METHOD AND APPARATUS FOR DISK DRIVE

Leonard R. Shenfield, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1977, Ser. No. 772,691

Int. Cl.[2] G06F *9/18, 13/00*

U.S. Cl. 364—200 **8 Claims**

1. Time slicing apparatus for a disk drive comprising:

first memory means for storing microcoded program rou-

tines and subroutines for carrying out predetermined disk drive operations, one of said routines being a main program routine that is comprised of a plurality of service routines, at least one of said service routines including a plurality of service subroutines;

second memory means including at least one register respectively associated with said at least one service routine for storing the addresses of locations in said first memory means at which the program instructions for said at least one service routine are stored;

a data processor coupled to said first and second memory means and including means for executing said plurality of service routines in sequence during a respective plurality of time slots of the main program routine processing cycle, means for executing said plurality of service subroutines in sequence with only one being executed each processing cycle during the time slot of said at least one service routine, and means including a program counter for supplying first address signals to said first memory means and second address signals to said second memory means;

means responsive to said first address signals for accessing program instructions in said first memory means and forwarding said accessed program instructions to said data processor for execution;

means responsive to said second address signals for loading the contents of said at least one register into said program counter during the time slot of said at least one service routine; and

means for changing the contents of said at least one register each processing cycle to the address of the first program instruction in said first memory means for the service subroutine next in sequence to be executed.

4,103,327

INTERRUPT CONTROL CIRCUIT

James Owen Dimmick, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 18, 1977, Ser. No. 779,142
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **9 Claims**

1. In a processor system,

a memory having at least one plural word program subroutine,

a memory address register,

means for receiving an interrupt request,

means including a normally enabled gating means responsive to the receipt of a request for continuously applying a first address word to said register to set it to a predetermined address specifying a unique location in said memory, said location containing the first program word of a subroutine associated with said interrupt request,

means controlled by said address register upon said application of said first address word for reading out said first program word from said memory location,

means for disabling said gating means in response to said readout of said first program word, and

means responsive to the disabling of said gating means for terminating the application of said first address word to said register,

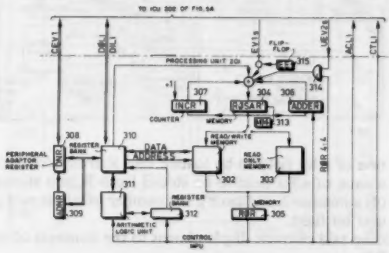
said gating means being ineffective when disabled to respond to any subsequently received interrupt requests.

4,103,328

CONTROL APPARATUS FOR CONTROLLING DATA FLOW BETWEEN A CONTROL PROCESSING UNIT AND PERIPHERAL DEVICES

Ginette Dalmasso, Bagnolet, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 7, 1975, Ser. No. 566,024
Claims priority, application France, Feb. 20, 1974, 74 05792
Int. Cl.[2] G06F *3/04, 9/16, 13/00*
U.S. Cl. 364—200 **5 Claims**



1. In a data processing system, a peripheral control apparatus for controlling the flow of data between a control processing unit and a plurality of peripheral devices, said peripheral control apparatus comprising:

1. interface channel means coupled to said control processing unit and to the plurality of peripheral devices for transmitting data between said peripheral control apparatus, said control processing unit and said plurality of peripheral devices;

2. interface control means coupled to said interface channel means for enabling a predetermined one of said plurality of peripheral devices or said control processing unit to communicate with said peripheral control apparatus;

3. memory means coupled to said interface control means for storing microprograms for controlling the data flow between said control processing unit and said one peripheral device, and for storing data derived from the said interface control means; and

4. processing means connected to said memory means and said interface control means for administering the sharing of processing time of said peripheral control apparatus between said plurality of peripheral devices and said control processing unit, and for processing data derived from said interface control means.

4,103,329

DATA PROCESSING SYSTEM WITH IMPROVED BIT FIELD HANDLING

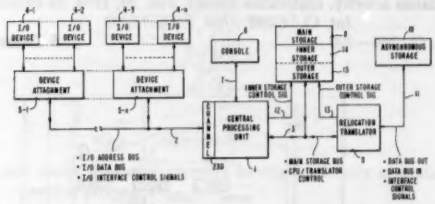
Michael Ian Davis, Kings Worthy near Winchester, England; Robert Allen Hood, and Gary Wayne Mayes, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,105
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—200 **4 Claims**

1. A method of operating an electronic data processing system so as to permit a single bit-field instruction to cause access of variable length bit fields in a storage of said system without requiring any special relation between the boundaries of addressable elements within said storage and the beginning and end of the bit fields, comprising the steps of:

initializing a base register RB of said system to contain a base address of an addressable element;

initializing a displacement register R7 to contain (1) the element displacement, from said base address, of the addressable element containing the first bit of a desired bit field, and (2) the bit displacement, from a boundary of the last recited addressable element, of said first bit; reading into an instruction register of said system a bitfield instruction which contains (1) an operation code identifying it as a load instruction or a store instruction for causing access of a bit field, (2) an identification of which register in said system shall be used as RB, (3) an identification of another register R in said system which is to be used as the destination of a bit field to be loaded into R from storage or the source of a bit field to be stored from R into storage and (4) a number L indicating the number of bits in said particular bit field;



adding said element displacement to the contents of register RB;

concatenating said bit displacement to the result of said addition, thereby providing an indication of the location in storage of said first bit; and

beginning with said first bit, either loading said number of bits into R from storage or storing said number of bits from R into storage depending upon whether said bit-field instruction is a load instruction or a store instruction, respectively.

4,103,330

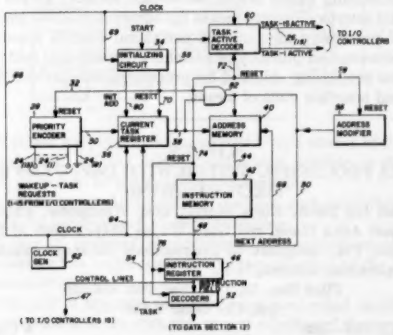
TASK HANDLING IN A DATA PROCESSING APPARATUS

Charles P. Thacker, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 518,679, Oct. 29, 1974. This application Feb. 16, 1977, Ser. No. 769,254

Int. Cl.[2] G06F *9/20, 9/18*

U.S. Cl. 364—200 **11 Claims**



1. A data processing apparatus for processing digital data in accordance with a plurality of predetermined tasks of preassigned priority values and identified by a respective plurality of task request signals in order to service a respective plurality of devices connected to said apparatus, each device capable of generating the respective one of said task request signals when requiring service by said apparatus, said apparatus comprising:

first memory means for storing a plurality of executable instructions each containing the address of a successor instruction;

means for addressing said first memory means to provide for the execution of selected instructions, said addressing means including second memory means organized to contain next addresses of said first memory means in respective locations thereof, each of said locations being dedicated to one of said predetermined tasks;

means for executing said selected instructions;

means coupled to said addressing means for selecting said locations in said second memory means whereby a particular next address is selected for addressing said first memory means;

means coupled to said first memory means for loading the address of a successor instruction contained in an addressed instruction into the dedicated location in said second memory means such that the successor instruction may be subsequently selected for execution; and

priority determining means responsive to said task request signals for providing a control signal to said selecting means enabling said selecting means to select the location in said second memory means dedicated to the task with the highest current priority value.

4,103,331

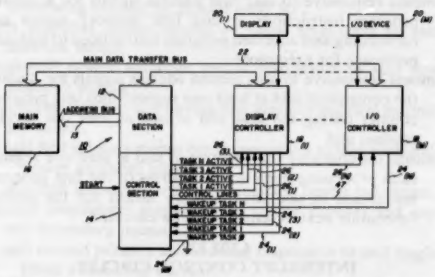
DATA PROCESSING DISPLAY SYSTEM

Charles P. Thacker, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 733,552, Oct. 18, 1976, which is a continuation of Ser. No. 519,153, Oct. 29, 1974, abandoned. This application May 25, 1977, Ser. No. 800,370

Int. Cl.[2] G06F *3/14*

U.S. Cl. 364—200 **7 Claims**



1. A data processing display system comprising:

a display device capable of displaying a desired image, said display device including a plurality of points each capable of being selectively illuminated;

a main memory storage device including a plurality of addressable storage locations capable of being addressed by predetermined address signals, each location capable of storing a multi-bit display word therein, at least some of said addressable storage locations including in the aggregate a number of display bits at least equal to said plurality of points of said display device whereby a display bit map of said desired image is capable of being stored and defined in said at least some addressable storage locations;

a display controller connected to said display device and responsive to predetermined instructions for controlling the illumination of said plurality of points of said display device;

a central processing unit including first means for generating said predetermined instructions for application to said display controller, and second means for generating said

predetermined address signals for application to said main memory storage device;

an address bus connected between said main memory storage device and said central processing unit for supplying said predetermined address signals to said main memory storage device;

a main data transfer bus connected to said main memory storage device, said central processing unit and said display controller, said main data transfer bus capable of supplying to said display controller the display words addressed from said at least some addressable storage locations of said memory storage device and said predetermined instructions;

said central processing unit including a data section and a control section, said control section including said first means for generating and means for supplying instructions to said data section, and said data section including said second means for generating and means for executing instructions supplied it from said control section; and

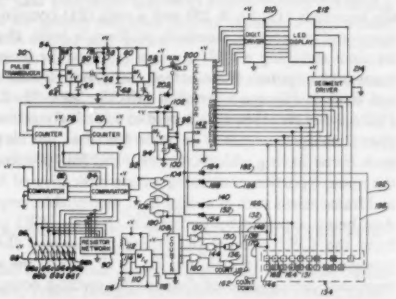
said display controller including third means for generating at least one display task request signal, said system further comprising means for supplying said at least one display task request signal to said control section, and said control section including means responsive to said at least one display task request signal for causing said means for supplying instructions to said data section to supply instructions relating to the display of said desired image by said display device.

4,103,332

MILE POST LOCATION DISPLAY SYSTEM

Robert D. Floyd, Dallas; Lee V. Gorman, Garland, and David L. Thummel, Dallas, all of Tex., assignors to David Floyd, Dallas, Tex.

Filed Jun. 20, 1977, Ser. No. 808,350
Int. Cl.[2] G06F *15/20*
U.S. Cl. 364—449 **12 Claims**



1. A location display system for a vehicle comprising:

means for generating a distance signal representative of rotation of a wheel of the vehicle;

switch means accessible to the vehicle operator for generating a predetermined reference signal dependent upon the diameter of a tire of the vehicle and being representative of a predetermined distance traveled by the vehicle;

comparator means for comparing said distance signal with said reference signal and for generating an output signal representing said predetermined distance traveled by the vehicle when said distance signal equals said reference signal;

mileage setting means accessible to the vehicle operator and including numerical digit keys operable for generating input signals representative of an initial mile post designation;

calculator means responsive to said input signals and said comparator output signal for performing arithmetic calculations on said signals and for generating an electrical output signal representing the position of the vehicle relative to subsequent mile post designations; and

display means coupled to said calculator means for visually displaying to the vehicle operator said electrical output signal generated by said calculator means.

4,103,333

CHARGE COUPLED CORRELATOR DEVICE

Raymond Poirier; Yves Hubert, and Noureddine Lakhoua, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 25, 1977, Ser. No. 762,795
Claims priority, application France, Jan. 30, 1976, 76 02584
Int. Cl.[2] G06G *7/19*
U.S. Cl. 364—824 **6 Claims**

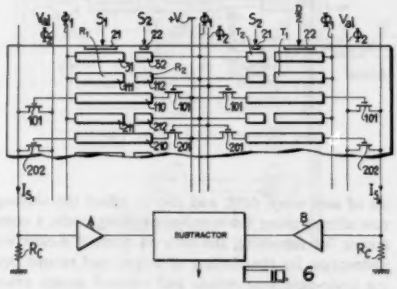


FIG. 6

1. A charge coupled correlator device comprising at least a first and a second register, each of these registers comprising a succession of stages and, in each stage at least one phase electrode and an output electrode means for connecting to a fixed potential said output electrode at the instant at which the charges pass from this stage to the next, and for disconnecting the same otherwise, said first register containing at each of said stages the charges corresponding to a first signal which is fixed as a function of time after storage, the second receiving a second signal varying as a function of time and sampled at the rate determined by a clock, the electrodes of said second register having small dimensions compared with those of the first, the output electrodes of each stage in each of the two registers being common and means connected to each of said common output electrodes for generating a third signal which is a function of the correlation product of said first and said second signals.

4,103,334

DATA HANDLING SYSTEM INVOLVING MEMORY-TO-MEMORY TRANSFER

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 733,776
Claims priority, application Japan, Oct. 21, 1975, 50-125870
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—900 **2 Claims**

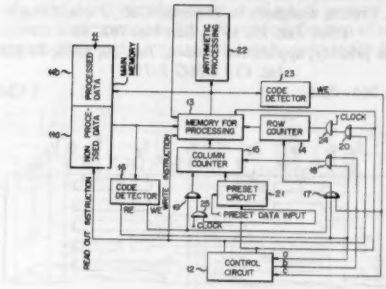
1. A device for controlling the handling of data which comprises:

main memory means for storing a large number of record data items in a state marked off by record data-positioning codes, said record data items being formed of series-arranged word data items of variable word length, each word data item containing at least one character marked off by word-positioning codes;

processing memory means for storing at least one record data item read out of the main memory, said processing memory means including columns containing words each having a certain number of characters falling within a specified range, a plurality of rows, and address control

means for effecting the shifting of characters through a column and also the shifting of a row itself; and

means for writing a record data item read out from the main memory means in the processing memory means, said writing means including word-positioning code detecting means for successively writing with shifting the characters of the foremost word data item of a record data item in the first or specified row, starting with the first character of said word data, and also to effect the shifting of a row after writing the word-positioning code, a command means for supplying the address control means with an instruction for the shifting of a row, and record positioning code-detecting means and control means associated therewith for enabling a plurality of word data items included in a record data item to be continuously written, until the record data-positioning code is detected.

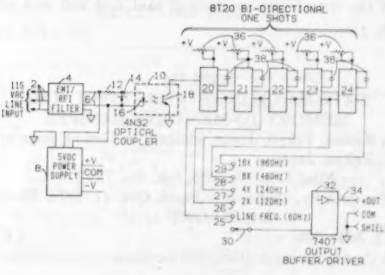


4,103,335

LINE SYNCHRONIZED INTERRUPT GENERATOR

Joseph D. Vitali, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 28, 1977, Ser. No. 763,744
Int. Cl.[2] H03K *5/00*
U.S. Cl. 364—900 **5 Claims**



4. Apparatus for generating indications of the zero crossings of an alternating current powerline signal and a harmonic of said powerline signal comprising

a solid state optical coupler having an input coupled to the powerline and an output for providing a square wave signal synchronized with said powerline signal, and

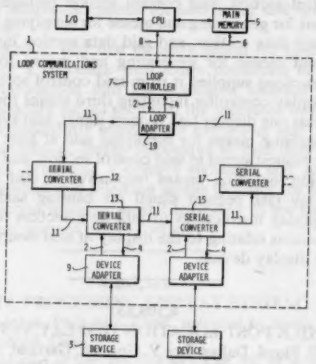
a first bidirectional one shot coupled to the output of the optical coupler and having an output for providing a square wave signal at twice the powerline frequency and synchronized with the powerline signal.

4,103,336

METHOD AND APPARATUS FOR ALLOCATING BANDWIDTH ON A LOOP SYSTEM COUPLING A CPU CHANNEL TO BULK STORAGE DEVICES

Abraham M. Gindi, San Jose, and Donald John Lang, Cupertino, both of Calif., assignors to International Business Machines Incorporated, Armonk, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,509
Int. Cl.[2] G06F *3/00, 9/00*
U.S. Cl. 364—900 **6 Claims**



1. In a system having a primary terminal (**7, 19**) and secondary terminals (**12, 13, 9; 15**) and a path (**11**) coupling the primary and secondary terminals to form a loop, the primary terminal attaching a CPU channel (**6, 8**) to the loop with the secondary terminals (**9**) attaching independently actuable storage devices (**3**), each terminal (FIGS. **2-19, 25, 27, 29, 31**; FIGS. **3-21, 25, 31**) being adapted to selectively generate repetitive framing intervals of duration less than the loop latency, each frame having address, control, and data portions thereof, the control portion containing a code indicative of frame type and frame status such as available or unavailable, empty or full; data being accessed by commands (RD or WR) originating from the CPU channel (**6, 8**) and transmitted through the primary terminal (**45, 55, 69, 71, 2, 19, 11**) to the secondary terminals during selected frames; the method comprising the steps of:

sending (FIGS. **4-101** to **111**; FIGS. **5-127, 129, 137, 139, 141, 143, 135**) a full frame of data by the primary terminal to an assigned secondary terminal each time said primary terminal receives a frame from any given secondary terminal requesting service;

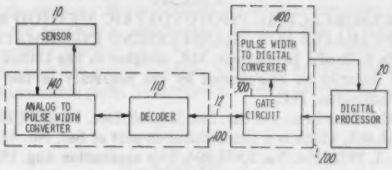
sending (FIGS. **4-111, 113, 101, 103, 105, 121, 125**; FIGS. **5-127, 129, 131, 133, 135**) an unassigned empty frame by the primary terminal each time said primary terminal receives a full frame of data from an assigned secondary terminal; and

sending (FIGS. **4-111, 113, 101, 114, 115, 117**; FIGS. **5-127, 129, 131**) a frame containing at least one command of status indication by the primary terminal to an assigned secondary terminal, there being a queue of commands (FIGS. **2-55**; FIGS. **4-115**) in the primary terminal of at least one, said command frame being sent in response to receipt of an unassigned empty frame, or otherwise regenerating by the primary of the unassigned empty frame.

4,103,337
DATA TRANSMISSION SYSTEM USING ANALOG TO PULSE WIDTH TO DIGITAL CONVERSION

Arliss Eugene Whiteside, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 17, 1976, Ser. No. 742,972
Int. Cl.[2] G06F *3/00*; G08B *26/00*; G08C *15/00*
U.S. Cl. 364—900 **30 Claims**



1. A data transmission system comprising:

digital processor means for processing digital data to produce an output, said digital processor means further including means for periodically generating data request signals having a predetermined pulse duration indicative of a request for new digital data;

sensor means for generating analog data having a value indicative of a sensed condition;

sensor interface means powered by said data request signals for generating a ground signal a determinable time after the beginning of said data request signal in response to said analog data, said ground signal being a low impedance to ground and said determinable time between the beginning of said data request signal and said ground signal being indicative of the value of said analog data;

processor interface means, receiving said data request signals from said digital processor means and said ground signal from said sensor interface means for generating digital data indicative of said determinable time between the beginning of said data request signal and said ground signal; said processor interface means further including means for gating said data request signals to said sensor interface means and means for transmitting said digital data to said digital processor means:

a single data transmission line interconnecting said sensor interface means and said processor interface means for transmitting said data request signal and said ground signal back and forth between said sensor interface means and said processor interface means.

4,103,338
SELF-DIAGNOSTIC METHOD AND APPARATUS FOR DISK DRIVE

Stipe Cizmic, San Mateo; Martin O. Halfhill, San Jose; James O. Jacques, Tracy; Douglas K. Mahon, Boulder Creek; Leonard R. Shenfield, Santa Clara, and Ronald W. Votaw, Morgan Hill, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

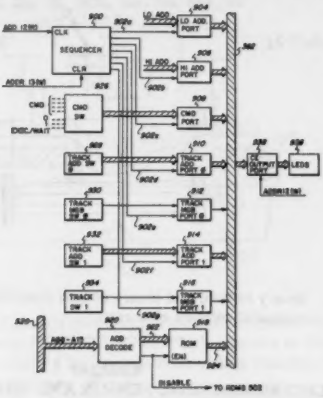
Filed Feb. 28, 1977, Ser. No. 773,022
Int. Cl.[2] G06F *11/00, 13/08*
U.S. Cl. 364—900 **4 Claims**

1.

The combination comprising:

a disk drive including a recording disk rotatable about its axis, an electromagnetic read/write head, actuator means for moving said head with respect to the axis of rotation of said disk, servo control means responsive to a set of instructions for controlling the speed and direction of movement of said head by said actuator means, and programmed data processing means including a microprocessor, first memory means for storing microcoded control programs for said disk drive, second memory means for storing some of said set of instructions for said servo control means therein, an address bus for supplying address signals from said microprocessor to said first and second memory means, and a data bus for supplying program instructions from said first memory means to said microprocessor, and for supplying said some instructions of said set of instructions from said second memory means to said servo control apparatus; and

an exerciser for said disk drive including means for developing test track address signals, means capable when enabled of supplying said test track address signals onto said data bus for application to said microprocessor, third



memory means for storing microcoded diagnostic programs for said exerciser, first decoder means coupled to said address bus and to said third memory means for decoding an address signal on said address bus in order to generate a new address signal for said third memory means, and means for supplying program instructions accessed from said third memory means in response to said new address signal onto said data bus for application to said microprocessor for initiating disk drive diagnostic operations.

4,103,339
ACOUSTIC SURFACE WAVE BUBBLE SWITCH

Wayne C. Hubbell, Richardson, and Christopher T. Chang, Dallas, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1976, Ser. No. 679,268
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—1 **5 Claims**

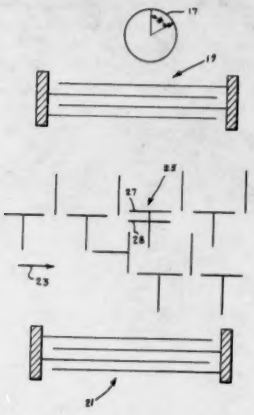
1. A system for switching the direction of movement of magnetic bubble domains in a sheet of material in which magnetic bubble domains can propagate, comprising:

a. a rotating in-plane magnetic field;

b. an array of magnetic overlay elements in said magnetic field for guiding the bubble domains, said array of magnetic overlay elements including a switching element positioned to present alternative paths for the bubble, said array of magnetic overlay elements forming a pattern of magnetic bars comprising respectively a single verticl bar in combination with a vertical bar and a horizontal bar in combination to form a T configuration, and

c. a pair of acoustic surface wave transducers for generating acoustic surface waves perpendicular to the switching element whereby acoustic surface waves control selection

of the paths of the bubble domains, said acoustic surface wave and said magnetic field cooperating to provide a



binary switch, said binary switch controlling said array of magnetic overlay elements.

4,103,340

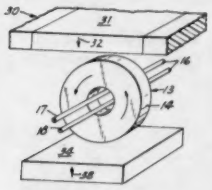
ELECTROMAGNETIC SENSOR AND MEMORY DEVICE

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 451,994, Mar. 18, 1975. This application Dec. 22, 1975, Ser. No. 643,014

Int. Cl.[2] G11C *17/02*

U.S. Cl. 365—97 **4 Claims**



1. An electromagnetic sensor system for detecting data magnetically encoded in a document, said system comprising:

a housing with at least one planar surface area;

a two dimensional planar array of bit indicators disposed in said housing in a parallel relationship to said surface area, which bit indicators each include:

at least one ferromagnetic core that is magnetizable to one of two alternate stable remanent magnetized states; and

a control member centrally disposed through said core and including drive means that provides a magnetic field for switching the magnetization of said ferromagnetic core from one stable remanent state to the other and also including sense means in which an electrical signal is induced during each stable state transition;

a plurality of magnetized bias field sources, each field source being associated with one of said cores and having a magnetic field to magnetize said associated core in a magnetized state that prevents the inducement of the stable remanent magnetized states and transitions therebetween; and

a magnetically encoded document disposed in surface-to-surface contact with the planar surface of said housing and containing data represented by a plurality of magnetic data bits some of which have a magnetic field substantially opposite in magnitude and direction to that of each of said bias field sources, said data bits located in various bit regions arranged in a two dimensional pattern that includes at least one bit region aligned with each of said bit indicators so that the magnetic fields of some of said data bits substantially cancel the magnetic fields of the bias field sources magnetizing the bit indicators aligned with the bit regions in which said data bits are located.

4,103,341

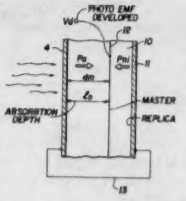
FERROELECTRIC PHOTOVOLTAIC METHOD AND APPARATUS FOR TRANSFERRING INFORMATION

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,015,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Aug. 15, 1977, Ser. No. 824,896

Int. Cl.[2] G11C *13/00, 11/22, 11/42*

U.S. Cl. 365—117 **17 Claims**



1. A method of transferring information from at least a portion of a photovoltaic ferroelectric storage means to at least another portion of a polarizable storage means comprising the steps of

providing at least a portion of a photovoltaic ferroelectric storage means already having a remanent polarization corresponding to said information therein and providing at least another portion of a polarizable storage means,

illuminating said at least a portion which already has said remanent polarization therein, whereby a photovoltage is produced, and,

applying said photovoltage across said at least another portion to which said information is to be transferred, whereby said photovoltage causes a remanent polarization to be effected in said at least another portion, and said information is transferred.

4,103,342

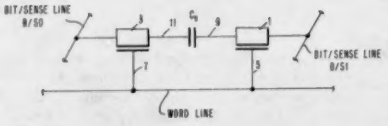
TWO-DEVICE MEMORY CELL WITH SINGLE FLOATING CAPACITOR

Ekkehard Fritz Miersch, Mahopac, and Dominic Patrick Spampinato, Ozone Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1976, Ser. No. 697,188

Int. Cl.[2] G11C *11/24, 11/40, 7/02*

U.S. Cl. 365—149 **9 Claims**



1. A two-device memory cell for a memory array, comprising:

a pair of field-effect transistor devices each having a source, drain and gate electrode with the said source and drain electrode of respective ones of said field-effect transistor

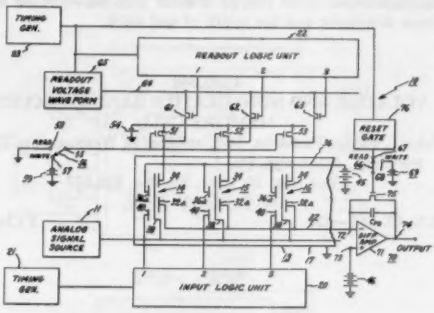
devices forming a series path the conduction of which is controlled by the gate electrode of respective ones of said devices, said devices being arranged so that one end of each of the respective source-drain paths is adapted to be connected to respective bit/sense line means for said memory array and so that each of the gate electrodes of said devices is adapted to be coupled to word line means for said memory array; and

a single capacitor directly connected between the other ends of the respective source-drain paths of said field-effect transistor devices so as to float between said respective bit/sense line means in series with each of the respective source-drain paths to thereby provide a differential sense signal.

4,103,343
CHARGE TRANSFER APPARATUS

William E. Engeler, Scotia, and Howard S. Goldberg, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1976, Ser. No. 702,944
Int. Cl.² G11C *11/34*
U.S. Cl. 365—183 **12 Claims**



1. Charge transfer apparatus comprising

a substrate of semiconductor material having a major surface,

a plurality of charge storage cells in said substrate adjacent said major surface, each including a first charge storage region, a second charge storage region, and an intermediate region separating said regions,

a plurality of first storage electrodes, each electrode insulatingly overlying a respective first charge storage region, said electrodes being interconnected,

a plurality of second storage electrodes, each electrode insulatingly overlying a respective second charge storage region,

a plurality of first gating electrodes, each insulatingly overlying a respective intermediate region, said gating electrodes being interconnected,

means for applying a fixed first potential to said interconnected first gating electrodes to establish a depletion surface potential in each of said intermediate regions of a fixed first value,

means for applying a second potential to said first storage electrodes to establish a depletion surface potential of a second value in each of said first storage regions less in absolute magnitude than said first value,

means for introducing into each of said charge storage cells a respective quantity of charge representing a respective sample of a first signal,

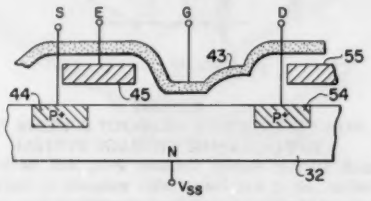
transfer means for transferring a first portion of charge from one storage region to the other storage region in each cell of a selected plurality of cells,

output means connected in circuit with said first electrodes for sensing the net total charge transferred to and from the first charge storage regions of said selected cells.

4,103,344
METHOD AND APPARATUS FOR ADDRESSING A NON-VOLATILE MEMORY ARRAY

John Lee Fagan, Pasadena; Marvin Hart White, Laurel, and Donald Ross Lampe, Elicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1976, Ser. No. 653,760
Int. Cl.² G11C *11/40*
U.S. Cl. 365—184 **16 Claims**



1. A method of charge addressing a dual dielectric MNOS memory cell having diffusion regions which function as both source and drain regions having a corresponding plurality of gates, comprising the steps of:

setting a charge in an interface between the two dielectrics of the charge storage device;

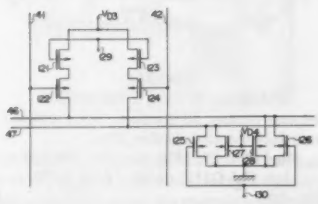
providing a conducting path for said stored charge from said charge storage device to a diffusion region of said memory cell;

activating said plurality of corresponding gates with predetermined voltages; and said corresponding plurality of gates comprise a memory gate and an enable gate adjacent each other, and said step of activating is performed by gating predetermined values of voltage with a predetermined relationship to said respective memory gate and enable gate to effect the dual source/drain function of the diffusion regions.

4,103,345
SEMICONDUCTOR MEMORY WITH DATA DETECTION CIRCUIT

Yasoji Suzuki, Kanagawa, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 26, 1976, Ser. No. 680,236
Claims priority, application Japan, Apr. 28, 1975, 50/50792; Dec. 3, 1975, 50/144522
Int. Cl.² G11C *7/06*
U.S. Cl. 365—190 **12 Claims**



1. A semiconductor memory device comprising a pair of data input lines; at least one pair of data lines associated with said pair of input lines; memory cells disposed in the form of a matrix having columns, the memory cells of each column being connected between a corresponding pair of said data lines; a first data output line; a data detection circuit including a first

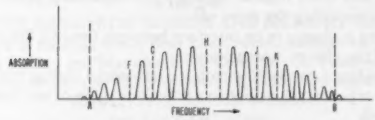
series circuit comprising first and second switching elements provided for each column and each said first series circuit being connected between a first-voltage receiving terminal for receiving a first specified voltage and said data output line, said first switching element for each column being responsive to a column selection signal for said column and said second switching element for each column having a control terminal connected to one data line of said pair of data lines for said column, and a third switching element commonly provided for said memory cells and connected between said data output line and a second voltage receiving terminal for receiving a second specified voltage lower than said first specified voltage.

4,103,346

NON-DESTRUCTIVE READOUT SCHEME FOR HOLOGRAPHIC STORAGE SYSTEM

Dietrich Haarer; Robert Vladimir Pole, and Silvia Leonor Voelker, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,150
Int. Cl.[2] G11C *13/04, 7/00*
U.S. Cl. 365—216 **11 Claims**



1. A non-destructive readout scheme suitable for use with a holographic storage system having information stored in three spatial dimensions and one frequency dimension comprising

a material exhibiting inhomogeneous absorption line broadening, said material adapted to undergo a photochromic reaction involving information stored in the non-volatile ground state of molecules upon exposure to a light source having a wavelength bandwidth narrower than the inhomogeneous line width, said broadened line having information stored at one or more first frequencies within said broadened line, and

means to sense the spatial variations of the refractive index changes at one or more second frequencies adjacent said first frequencies, said second frequencies being in the vicinity of one line width from said first frequency and being within said broadened line.

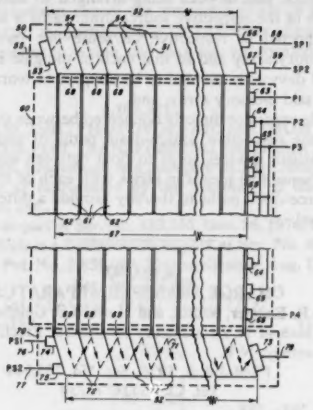
4,103,347

ZIG-ZAG SPS CCD MEMORY

James Brockman Barton, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1976, Ser. No. 736,904
Int. Cl.[2] G11C *19/28, 11/34, 9/00*
U.S. Cl. 365—219 **14 Claims**

8. A charge coupled device memory comprised of a serial-parallel-serial memory block; said block including an N-stage serial-parallel charge coupled device register, an M-stage charge coupled device stack, and an N-stage parallel-serial charge coupled device register; said stack having N inputs coupled to N parallel outputs of said serial-parallel register, and having N outputs coupled to N parallel inputs of said parallel-serial register thereby forming a serial-parallel-serial charge transfer path; wherein each of said registers have a



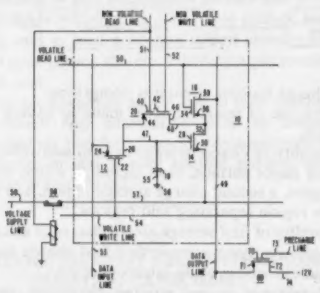
zig-zag shaped serial charge transfer path to decrease their linear dimension and the width of said stack.

4,103,348

VOLATILE AND NONVOLATILE RANDOM ACCESS MEMORY CELL

John L. Fagan, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,577
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—228 **9 Claims**



1. A random access memory cell for storing information in both volatile and nonvolatile form utilizing at least a volatile read line, nonvolatile read line, nonvolatile write line, first voltage supply line, volatile write line, data input line and data output line comprising:

first, second and third field effect transistors each having a gate, source and drain electrode,

a capacitor means having a first and second terminal,

a dual gate variable threshold transistor means having at least a first and second gate, first source and first drain electrode,

said drain electrode of said first transistor coupled to said gate electrode of said second transistor, said first terminal of said capacitor means and said source electrode of said variable threshold transistor,

said drain electrode of said second transistor coupled to said source electrode of said third transistor and said drain electrode of said variable threshold transistor,

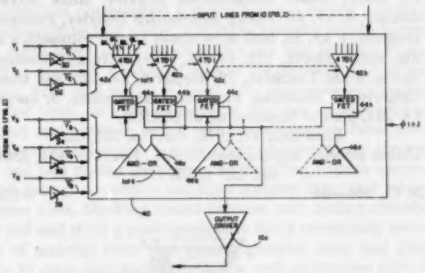
said second terminal of said capacitor means coupled to a reference potential,
said volatile read line coupled to said gate electrode of said third transistor, said nonvolatile read line coupled to said first gate electrode of said variable threshold transistor,
said nonvolatile write line coupled to said second gate electrode of said variable threshold transistor for coupling a polarizing voltage and at other times a read voltage to said second gate electrode,
said first voltage supply line coupled at times to said source electrode of said second transistor,
said volatile write line coupled to said gate electrode of said first transistor,
said data input line coupled to said source electrode of said first transistor, and
said data output line coupled to said drain electrode of said third transistor.

4,103,349

OUTPUT ADDRESS DECODER WITH GATING LOGIC FOR INCREASED SPEED AND LESS CHIP AREA

Melvin L. Marmet, Corona, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 16, 1977, Ser. No. 807,460
Int. Cl.² G11C *8/02*
U.S. Cl. 365—231 **6 Claims**



2. A circuit responsive to an address code represented by a plurality of address signals applied thereto for selecting an input line from a plurality of signal lines and for applying the signal on a selected bit line to an output line, the circuit comprising:
a plurality of selectors, each of said selectors having an output terminal to which one of said input lines is connected in response to at least one of said address signals,
a plurality of gate-signal controlled switches, each of said switches having a gate electrode, a source electrode, and a drain electrode, said source electrodes of said switches connected respectively to the output terminals of said selectors, the drain electrodes of said switches connected to each other and to said output line, and
at least one AND/OR circuit for generating a gate signal in response to a particular address code and for applying said gate signal to a gate terminal of a gate-signal controlled switch.

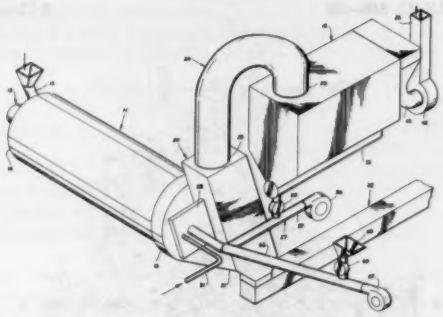
4,103,350

METHOD OF REDUCING EMISSION OF PARTICULATE MATTER

James Donald Brock, and Erbie Gail Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Division of Ser. No. 685,087, May 10, 1976. This application Mar. 22, 1977, Ser. No. 780,173
Int. Cl.² B28C *1/22, 5/46*
U.S. Cl. 366—22 **6 Claims**

1. Method of reducing the emission of particulate matter during the preparation of asphalt aggregate mixture in a rotating mixing drum, comprising the steps of:
introducing aggregate material at a first region in the mixing drum whereby airborne particulate matter is present in the mixing drum;
introducing a quantity of liquid asphalt material to said mixing drum for mixture with said aggregate material at a second region in said mixing drum;



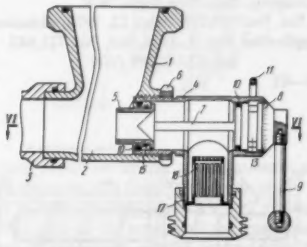
passing said airborne particulate matter through a porous filter medium which is external of said mixing drum to separate said airborne particulate matter from air; and
combining said separated particulate matter with said liquid asphalt material being introduced to said second region in said mixing drum so as to return said separated particulate matter to said mixing drum.

4,103,351

APPARATUS FOR CONTROLLING THE DENSITY OF A PLUGGING FLUID

Alexandr Sergeevich Mamvriisky, prospekt Revoljutsii, 26/36, kv. 7, and Alexandr Mikhailovich Lapchenko, ulitsa Moskovskaya, 68, both of Grozny, U.S.S.R.

Division of Ser. No. 598,550, Jul. 24, 1975, Pat. No. 4,027,860. This application Mar. 14, 1977, Ser. No. 777,071
Int. Cl.² B01F *15/02*
U.S. Cl. 366—30 **8 Claims**

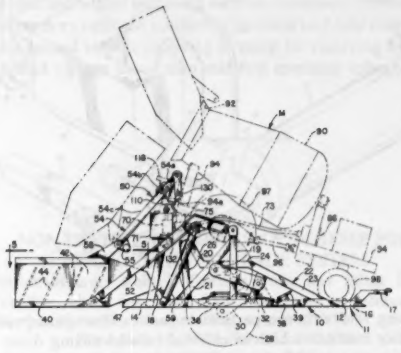


1. An hydraulic mixing apparatus for the preparation of a fluid, such as a plugging fluid, comprising a feed hopper for a dry cementing material, a unit for charging a carrier liquid and a mixing chamber, wherein the outlet of the charging unit is positioned on a common axis with the inlet of a discharge conduit; said charging unit including a rotatable sleeve sealingly mounted in the charging unit, a nozzle member, having a slot-shaped outlet, adapted to be accommodated within said sleeve, and means for rotating said sleeve jointly with said nozzle member about the common longitudinal axis thereof.

4,103,352
TRANSPORTER AND LOADING BOX FOR CONCRETE MIXER

Charles J. Cratty, Seattle, Wash., assignor to Astro Development Corporation, Seattle, Wash.

Filed Jun. 28, 1976, Ser. No. 700,463
Int. Cl.[2] B23C 7/08
U.S. Cl. 366—39 8 Claims

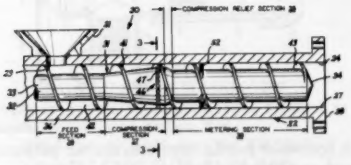


6. A mixer loading mechanism comprising a frame, means on said frame for guiding a portable mixer onto the frame into a load position, said mixer having an inlet, a loading box coupled to said frame and movable between an elevated dump position above the mixer inlet and a fill position close to the ground, means for moving the box between said fill position and said raised dump position, the box having an outlet positioned over the mixer inlet when in said dump position whereby the mixer can be loaded by dumping the contents of the box into said inlet, said mixer being self-propelled and having wheels and a power takeoff, said means for moving the box including a pump, hydraulic actuators and a valve movable into box raising and box lowering positions, means for coupling said pump to said power takeoff when the mixer is driven into said load position, and means for moving the valve into the raise box position when the mixer is in said load position.

4,103,353
APPARATUS FOR WORKING EXPANDABLE THERMOPLASTIC MATERIALS

Timothy Stephen Dougherty, Roswell, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 557,728, Mar. 12, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,643
Int. Cl.[2] B29B 1/06
U.S. Cl. 366—81 3 Claims



1. An apparatus for extruding expandable thermoplastic materials, which comprises:

means for compressing and heating an expandable thermoplastic material to progressively melt portions of successive sections of the expandable thermoplastic material, said means including a core having a channel formed by an uninterrupted helical flight extending about an axis of rotation of the core in a downstream direction from a supply end to an output end with a compression section of the channel which decreases in cross-sectional area continuously in the downstream direction, said compression section being such as to cause unmelted portions of the expandable thermoplastic material to fragment at a predetermined location along its length;

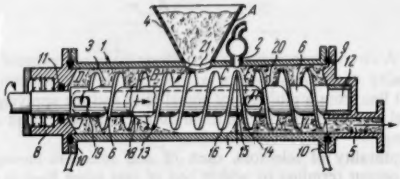
a plurality of pins connected to the core at the predetermined location within the compression section for subjecting the thermoplastic material to forces with each of the pins having at least some portion thereof lying in a plane which is perpendicular to the axis of rotation and with the flight being continuous through the plane to cause the fragmentation of the unmelted portions of successive sections of the thermoplastic material to be continuous; and

means for moving rotatably the core to advance the thermoplastic material along the channel to provide a melt at the output end with corresponding portions of successive sections having substantially identical thermal histories.

4,103,354
PROCESS AND APPARATUS FOR VACUUM TREATMENT OF VISCOPLASTIC MATERIALS

Vasily Matveevich Gorbatov, prospekt Mira, 74, kv. 70, Moscow; Taras Filippovich Demchenko, Pselskaya ulitsa, 8, kv. 37, Sumy; Semen Mikhailovich Bobylev, ulitsa Salvadora Aliende, 5, kv. 63; Valery Semenovich Bobylev, Proletarsky prospekt, 1, kv. 36, both of Moscow; Leonid Filippovich Zhilkin, ulitsa Kirova, 122, kv. 65, Sumy; Evgeny Timofeevich Spirin, ulitsa Usacheva, 29, korpus 3, kv. 203, and Genrikh Grigorievich Shirinian, Kantimirovskaya ulitsa, 3, korpus 2, kv. 251, both of Moscow, all of U.S.S.R.

Filed Dec. 17, 1976, Ser. No. 751,950
Claims priority, application U.S.S.R., Dec. 19, 1975, 2301129
Int. Cl.[2] B29B 1/06
U.S. Cl. 366—88 4 Claims



1. An apparatus for vacuum treatment of viscoplastic materials comprising: a container; a pipe connected to said container and communicating with a vacuum system for providing a vacuum zone in the container; a feed hopper connected to said container for continously feeding viscoplastic material to the vacuum zone of the container for first vacuum treatment of the material; an outlet opening for feeding the viscoplastic material from the container to a subsequent production stage; an auger located within said container and having main turns which continuously cause the viscoplastic material to move from the vacuum zone of the container and form a first higher pressure zone from the material; said auger having auxiliary turns running opposite to the direction of the main turns of the auger and conjugated with the main turns along a line extending at the same elevation as said pipe communicating with the vacuum system; said container having means for returning the viscoplastic material from the first higher pressure zone back to the vacuum zone for a secondary vacuum treatment thereof and feeding the material to said auxiliary turns of the auger which cause the material to move in the vacuum zone in a thin layer and form a second higher pressure zone from the material prior to its leaving through said outlet opening to the subsequent production stage.

4,103,355
MIXING EXTRUDER

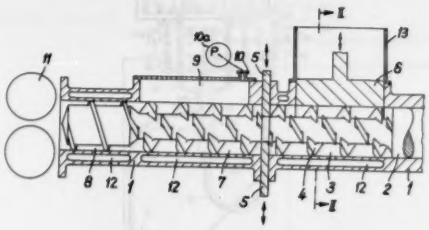
Dietmar Weber, Hamburg, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 565,213, Apr. 4, 1975, abandoned. This application Sep. 1, 1976, Ser. No. 719,816

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1974, 2417116

Int. Cl.² B29B *1/06*

U.S. Cl. 366—90 **6 Claims**



1. A mixing extruder for mixing successive batches of material and for ejecting material continuously through an outlet, comprising in combination a single housing having a passage therethrough to said outlet, a unitary extruder worm formed with spiral webs and extending through said passage to said outlet at one end, a material inlet at the opposite end of said passage from said outlet to form with said passage a mixing chamber zone, an ejecting zone at the end of said passage adjacent said outlet in which said extruder worm feeds material through said outlet, a storing zone between said ejecting zone and said mixing chamber zone including a space opening to said passage to receive and store material from said mixing chamber zone, blocking means between said mixing chamber zone and said storing zone operable to block completely movement of material from said mixing chamber zone and alternately to open said passage to allow such movement fully to said storing zone, said mixing chamber zone having a closure member for said material inlet to exert pressure on said material and to confine said material in said mixing chamber zone and by said blocking member, the spiral webs of said worm in said mixing chamber zone being interrupted to provide spaces between successive portions of said web for mixing said material, said space in said storing zone receiving material from a batch mixed in said mixing chamber zone when said blocking means is operated to open said passages, said worm extending as a unit over three zones including the mixing chamber, storing and ejecting zones for continuously feeding material in said storing zone through said outlet, whereby successive batches of material may be mixed discontinuously in said mixing chamber zone while preceding batches are fed continuously uniformly from said storing zone through said outlet.

4,103,356
SYNCHRONIZED PUSH-PULL INVERTER

John Reid Finlay, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 23, 1976, Ser. No. 744,274

Int. Cl.² H02M *7/537*

U.S. Cl. 363—22 **4 Claims**

1. In a push-pull free-running inverter comprising:

a pair of switching transistors connected in a push-pull configuration to the primary of an output transformer;

means for coupling the secondary of said output transformer to the primary of a saturable transformer;

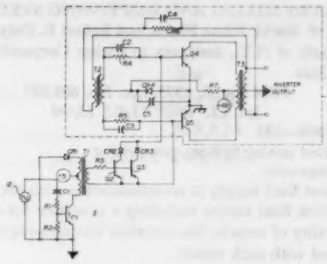
means for coupling opposed ends of the secondary of said saturable transformer to the respective bases of the pair of switching transistors;

the improvement comprising:

a pair of control transistors;

means including a diode connecting the emitter-collector of each control transistor between the bases of the pair of switching transistors;

means for applying a square-wave signal having a frequency



at least as great as the free-running frequency of the inverter between the base-emitter of each of the control transistors to alternately gate said control transistors on during alternate half-cycles of the square-wave signal,

whereby the inverter is synchronized to the square-wave signal.

4,103,357
PROCESS AND DEVICE FOR CONTINUOUS METERING AND MIXING

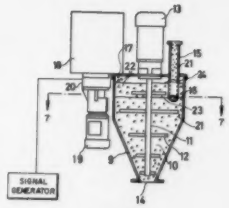
Haruo Noguchi, Yokohama, Japan, and Max Reinhard, Bad Homburg, Fed. Rep. of Germany, assignors to Colortronic Reinhard & Co., KG, Friedrichsdorf-Koppern, Fed. Rep. of Germany and Colortronic Co., Ltd., Tokyo, Japan

Division of Ser. No. 529,064, Dec. 3, 1974, Pat. No. 3,989,229. This application Aug. 3, 1976, Ser. No. 711,422

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1973, 2360644

Int. Cl.² B01F *15/04*

U.S. Cl. 366—152 **4 Claims**



1. A mixing vessel for mixing a main material and complemental raw materials in a fixed ratio comprising:

(a) walls defining a substantially vertical mixing vessel and an outlet port at the bottom of the vessel such that the mixture in the vessel moves downwardly by its owns weight at the rate it is withdrawn through the outlet port,

(b) a feed conduit for delivering synthetic materials under their own weight to the vessel, said conduit opening into the vessel below the top thereof and said conduit having an opening disposed such that it assumes an angle of impingement relative to the line of flow whereby the vessel will not accept main material from the feed conduit when the vessel already contains a mixture at or exceeding the height of the feed conduit opening,

(c) means for feeding complemental raw material above the level of the mixture therein in metered amounts propor-

tional to the mass rate of flow of the material withdrawn from the vessel, and

(d) rotating agitator means disposed in the vessel for mixing and distributing the materials uniformly therein.

4,103,358

FLUID MIXING AND DISPENSING SYSTEM

Leonard W. Gacki, White Plains, and Robert E. Daly, Farmingdale, both of N.Y., assignors to Picker Corporation, Cleveland, Ohio

Filed Sep. 3, 1975, Ser. No. 609,957

Int. Cl.[2] B01F *15/02, 15/04*

U.S. Cl. 366—153 **57 Claims**

1. A fluid mixing system, comprising:

(a) a reservoir;

(b) a first fluid supply in communication with the reservoir, the first fluid supply including a container for carrying a plurality of vessels, the container having an opening associated with each vessel;

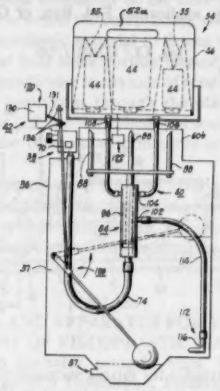
(c) a fluid release assembly disposed intermediate the first fluid supply and the reservoir, the fluid release assembly including a piercing assembly for puncturing the vessels to release the first fluid into the reservoir through the openings;

(d) a second fluid supply in communication with the reservoir and the fluid release assembly, the flow of the second fluid controlling operation of the fluid release assembly;

(e) a valve disposed intermediate the second fluid supply and the reservoir upstream of the fluid release assembly;

(f) a valve control to control the valve and therefore the flow of the second fluid to the fluid release assembly and the reservoir;

(g) a liquid level control means responsive to the level of fluid in the reservoir to activate the valve control when the fluid in the reservoir reaches a predetermined level; and



(h) an interlock switch control means responsive to the presence of the first fluid supply to actuate the valve control when the vessels in the container contain a predetermined amount of fluid.

DESIGN PATENTS

GRANTED JUL. 25, 1978

ERRATA

For CLASS	See PATENT NO.
D8–313	248,624
D8–339	248,625

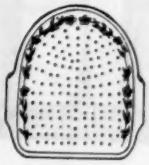
DESIGNS

JULY 25, 1978

248,596
COMBINED SAFETY HARNESS AND LIGHT
Hubert King Neyman, 8825 N. Hickory Valley Rd., Chattanooga, Tenn. 37416
Filed Apr. 23, 1976, Ser. No. 679,822
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—27

248,597
AFTER SKI BOOT
Paolo Sinigaglia, Legnaro, Italy, assignor to Simod S.a.s. di Sinigaglia Paolo & C., Legnaro (Padova), Italy
Filed Oct. 1, 1976, Ser. No. 728,639
Claims priority, application Italy, Apr. 1, 1976, 61910 B/76
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

248,598
THUMB GUARD
Melvin Herman Bahmer, 11257 Allegheny, Sun Valley, Calif. 91352
Filed Jun. 11, 1976, Ser. No. 695,316
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D3—19 E

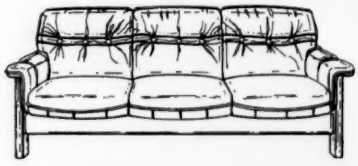


248,599
BABY SEAT
George L. Mears, 14432 Valverde Ct., San Diego, Calif. 92129
Filed May 20, 1976, Ser. No. 688,272
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—8

248,600
CHAIR
José A. Lopez, Miami, Fla., assignor to Camilo Muebles, Inc., Coral Gables, Fla.
Division of Ser. No. 581,699, May 28, 1975, Pat. No. Des. 242,404. This application Jun. 30, 1976, Ser. No. 701,423
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

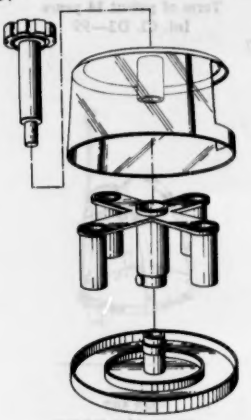
248,601
FOLDABLE BLEACHER SEAT
James E. Pierce, 25675 Avenida Jolita, and Max E. Goodwin, 25333 Via Dona Christa, both of Valencia, Calif. 91355
Filed Apr. 28, 1976, Ser. No. 680,975
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

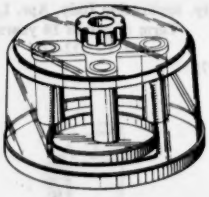
248,602
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Feb. 4, 1977, Ser. No. 765,858
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



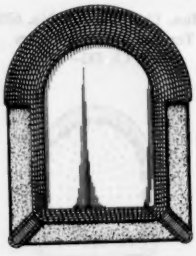
248,603
SEAT
Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Hickory, N.C.
Filed Apr. 21, 1976, Ser. No. 678,834
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

248,604
PAPER ROLL HOLDER FOR TOILET PAPER OR SIMILAR ARTICLE
Lars Lander, Zug, Switzerland, assignor to Cepasy AG, Zug, Switzerland
Filed May 27, 1977, Ser. No. 801,297
Claims priority, application Switzerland, Dec. 9, 1976, 64176/76
Term of patent 14 years
Int. Cl. D23—*02*; D7—*01*
U.S. Cl. D6—97

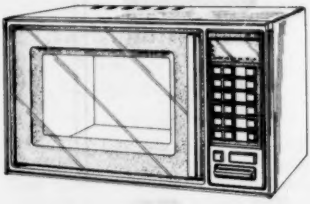




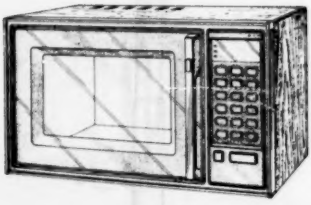
248,605
PICTURE FRAME
David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.
Filed Mar. 31, 1977, Ser. No. 783,293
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—232



248,606
MICROWAVE OVEN
Daisaku Mori, Yamato Kouriyama; Masamichi Yamamura, Osaka; Yoichi Takahashi, Yamato Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan
Filed Apr. 28, 1977, Ser. No. 791,918
Claims priority, application Japan, Feb. 4, 1977, 52-3640
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



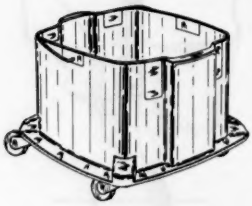
248,607
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Daisaku Mori; Yoichi Takahashi, both of Yamato Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Apr. 28, 1977, Ser. No. 791,915
Claims priority, application Japan, Nov. 19, 1976, 51-45634
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



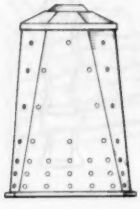
248,608
SPOON OR SIMILAR ARTICLE
Frank R. Perry, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 10, 1976, Ser. No. 749,705
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

248,609
POTATO PEELER HANDLE
Kenneth F. Fischer, Roseland, N.J., assignor to Acme Metal Goods Mfg. Co., Newark, N.J.
Filed Feb. 10, 1977, Ser. No. 767,654
Term of patent 3 years
Int. Cl. D7—*04*
U.S. Cl. D7—152

248,610
BUCKET
Daniel A. Schwartz, Long Beach, Calif., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Dec. 1, 1976, Ser. No. 746,311
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187



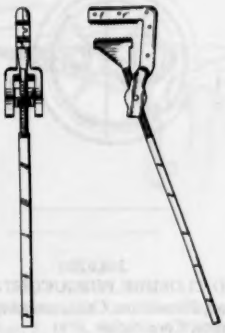
248,611
COMPOST CONTAINER
John Lindsay Dingwall, Randburg, Transvaal, South Africa, assignor to Moulded Components and Roto Moulding South Africa (Proprietary) Limited, Edenvale, South Africa
Filed Nov. 26, 1976, Ser. No. 745,422
Claims priority, application South Africa, Jun. 17, 1976, 76/0800
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



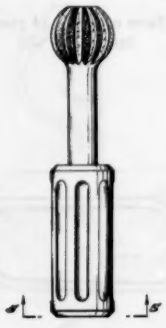
248,612
LEAF RAKE
David B. Oas, Girard, Pa., assignor to Tantera, Inc., Girard, Pa.
Filed Jun. 9, 1976, Ser. No. 694,200
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13

248,613
GAS MAIN VALVE WRENCH
Thomas Pace, 2426 Beechwood Ave., San Jose, Calif. 95128, and Keith R. Grammer, 809 Nebin Way, San Jose, Calif. 95113
Filed Mar. 17, 1977, Ser. No. 778,489
Term of patent 3 years
Int. Cl. D8—*05*
U.S. Cl. D8—17

248,614
WRENCH
John J. Dobias, 1212 Sumach Dr., Windsor, Ontario, Canada N8S 2S4
Filed Jan. 3, 1977, Ser. No. 756,383
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—23



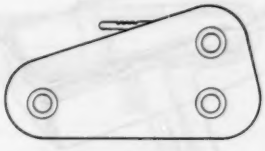
248,615
DRIVE TOOL
Bosko Grabovac, Mission Viejo, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.
Filed Aug. 25, 1976, Ser. No. 717,865
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82



248,616
CONTOURED MOTORCYCLE HAND GRIP OR THE LIKE
George A. Johnson, 27239 Barada Ave., Saugus, Calif. 91350
Filed Jun. 14, 1976, Ser. No. 695,860
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D8—303

248,617
SASH LOCK
Ralph Cavalucci, New York, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.
Filed Jan. 3, 1977, Ser. No. 756,370
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—337

248,618
BUCKLE
James R. Anthony, Indianapolis, Ind., assignor to Indiana Mills & Manufacturing, Inc.
Filed Oct. 27, 1976, Ser. No. 736,000
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



248,619
BOTTLE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,904
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

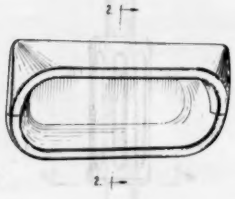
248,620
PACKAGE OF CANDY OR THE LIKE
Amilcare Dogliotti, Neive (Cuneo), assignor to P. Ferrero and C.-S.p.A., Cuneo, Italy
Filed Aug. 31, 1976, Ser. No. 719,292
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182

248,621
COVERED CONTAINER FOR MAIL OR THE LIKE
David Stewart Hay, Ottawa, and Alfred Weston Bennett, Gatineau, both of Canada, assignors to Postmaster General of Canada, Canada
Filed Feb. 12, 1976, Ser. No. 657,634
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

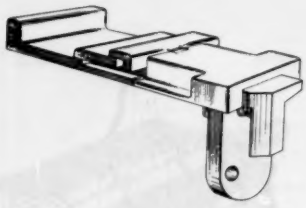
248,622
END CLOSURE FOR A CONTAINER
Gordon R. Gane, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation
Filed Aug. 9, 1976, Ser. No. 712,973
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

248,623
END CLOSURE FOR A CONTAINER
Gordon R. Gane, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation
Filed Aug. 9, 1976, Ser. No. 712,974
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

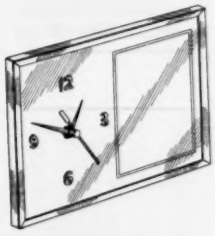
248,624
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE
Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany
Filed May 12, 1976, Ser. No. 685,568
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 6 AR 220/75
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—313



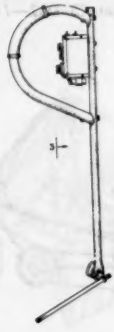
248,625
COMBINED GUIDE AND LOCK FOR A SLIDING WINDOW SASH
Edgar B. Roesch, Pennington, N.J., assignor to The Roesch Trust of which Lesley B. Roesch and Robert Patterson are trustees, Pennington, N.J.
Filed Jan. 10, 1977, Ser. No. 757,848
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—339



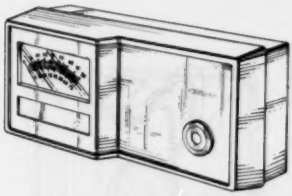
248,626
PICTURE CLOCK
John C. Lucich, 12835 Sundance Ave., San Diego, Calif. 92129
Filed Apr. 5, 1976, Ser. No. 673,621
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



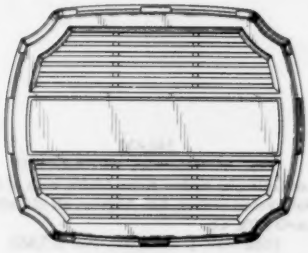
248,627
DETECTOR OR THE LIKE
Jerry C. Tyndall, 907 Denise Ave., Coats, N.C.
Filed Sep. 7, 1976, Ser. No. 720,949
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



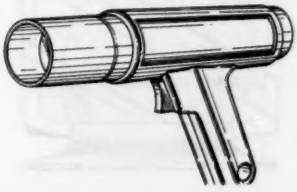
248,628
TRANSMITTER MONITORING METER
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corp., Los Angeles, Calif.
Filed Aug. 19, 1976, Ser. No. 716,005
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75



248,629
HOUSING FOR FIRE AND SMOKE DETECTOR
Frederick J. Conforti, Aurora; Roy C. A. Robertson, Bolingbrook, and Harvey Hanig, North Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.
Filed Jul. 5, 1977, Ser. No. 812,511
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D10—121



248,630
TIMING LIGHT
David E. Maxwell, Cary; James R. Shaffer, Mt. Prospect, and Lee Radtke, Lake Zurich, all of Ill., assignors to Sun Electric Corporation, Chicago, Ill.
Filed Nov. 24, 1976, Ser. No. 744,698
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—112



248,631

END CONNECTOR FOR BRACELET OR THE LIKE

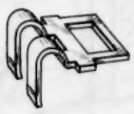
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.

Filed Apr. 19, 1976, Ser. No. 678,419

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—94



248,632

VISUAL DISPLAY APPARATUS

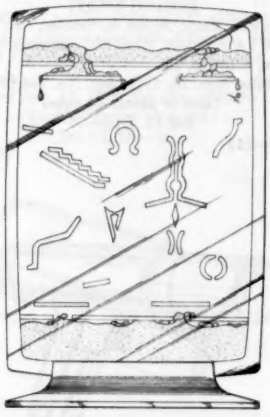
Richard Lee Gillespie; Arthur Kelso Melin, both of San Gabriel, and Elliot Everett Dalton, Los Angeles, all of Calif., assignors to Wham-O Mfg. Co.

Filed Nov. 1, 1976, Ser. No. 737,662

Term of patent 14 years

Int. Cl. D11—*02;* D21—*01*

U.S. Cl. D11—131



248,633

PLANTER

Ronald W. Wood, North Easton, Mass., assignor to Masta Associates, Arlington, Va.

Filed Oct. 12, 1976, Ser. No. 731,201

Term of patent 7 years

Int. Cl. D11—*02;* D6—*06*

U.S. Cl. D11—155

248,634

BICYCLE

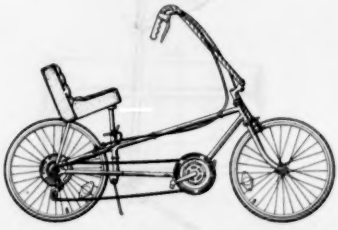
Robert Souza, 8270-68th St. North, Pinellas Park, Fla. 33565, and Richard E. Thompson, 10793-49th St. North, Clearwater, Fla. 33515

Filed Oct. 29, 1976, Ser. No. 737,143

Term of patent 14 years

Int. Cl. D12—*11*

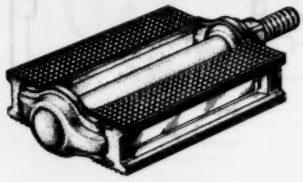
U.S. Cl. D12—111



248,635
BICYCLE PEDAL

Carlton P. Pawsat, and Robert F. Humlong, both of Maysville, Ky., assignors to Wald Manufacturing Company, Inc., Maysville, Ky.

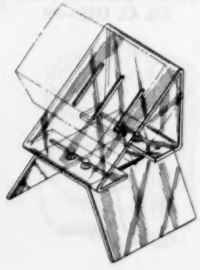
Filed Sep. 27, 1976, Ser. No. 727,314
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—125



248,636
AUTOMOBILE ACCESSORY MOUNT

Harvey L. Stanley, 3312 Lancelot, Dallas, Tex. 75229

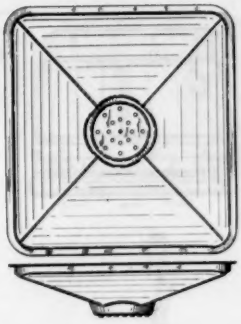
Filed Sep. 18, 1975, Ser. No. 614,543
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



248,637
TRANSMISSION DRAIN PAN

Philip F. Bishop, Stanhope, N.J., assignor to Transpan Products, Inc., Stanhope, N.J.

Filed Nov. 13, 1975, Ser. No. 631,466
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

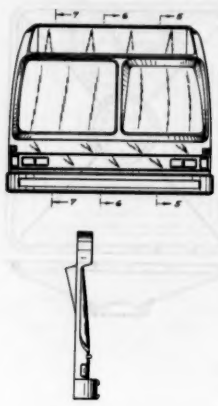


248,638
WIND DEFLECTOR FOR BICYCLES

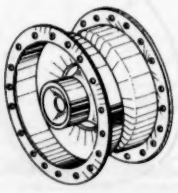
Glen J. Brown, 386 E. Poppyfields Dr., Altadena, Calif. 91001

Filed Dec. 20, 1976, Ser. No. 752,275
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

248,639
FRONT PANEL UNIT FOR A BUS
Norman J. James, Bonita, and Larry G. Hickey, Chula Vista, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.
Filed Mar. 19, 1976, Ser. No. 668,482
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—196



248,640
HUB FOR BICYCLE
Chin-Hou Hsieh, Feng Yuan, Taiwan, assignor to Valisum Industries Ltd., Taiwan, Taiwan
Filed May 4, 1977, Ser. No. 793,793
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—207

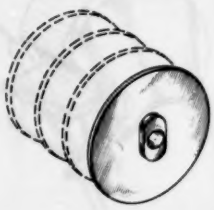


248,641
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT
Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 12, 1976, Ser. No. 731,327
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17

248,642
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT
Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 12, 1976, Ser. No. 731,329
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17

248,643
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT
Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 12, 1976, Ser. No. 731,330
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17

248,644
FRONT PANEL FOR KNOB-TYPE ELECTRIC FENCE INSULATOR
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026
Filed May 14, 1976, Ser. No. 686,283
Term of patent 14 years
Int. Cl. D8—*08;* D13—*03*
U.S. Cl. D13—18

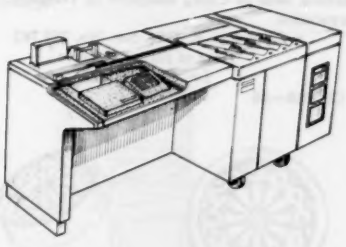


248,645
FRONT PANEL FOR ALL-PURPOSE ELECTRIC FENCE INSULATOR
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed May 14, 1976, Ser. No. 686,311
Term of patent 14 years
Int. Cl. D13—*03;* D8—*08*
U.S. Cl. D13—18

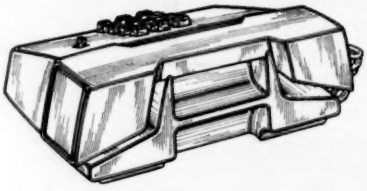
248,646
CONSOLE RECORD PLAYER
James F. Rebert, 3143 Pinehurst, and John W. Rebert, 1850 Burning Tree, both of Decatur, Ill. 62521
Filed Apr. 21, 1976, Ser. No. 671,178
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17

248,647
LOUDSPEAKER
Dale A. Nussdorfer, Anaheim, Calif., assignor to Altec Corporation, Anaheim, Calif.
Filed Apr. 14, 1976, Ser. No. 676,851
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

248,648
MODULAR DOCUMENT PROCESSING ENCODER
Richard G. Clayton, Detroit, and Robert C. Schade, Farmington Hills, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 574,723, May 5, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,430
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

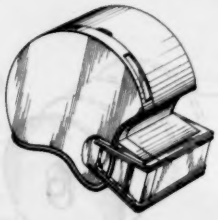


248,649
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Mar. 22, 1976, Ser. No. 669,184
Claims priority, application Sweden, Sep. 24, 1975, 1866/75
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

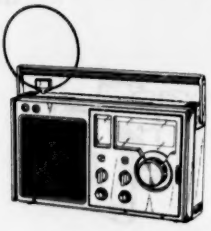


248,650
TELEPHONE MOUTHPIECE KEYBOARD
Donald M. Bellenger, San Francisco, and Paul David Major, Oakland, both of Calif., assignors to Telephone Electronics Corporation
Filed Oct. 8, 1976, Ser. No. 730,762
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

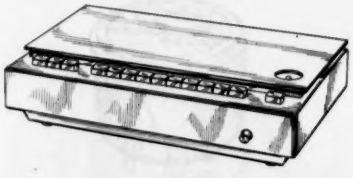
248,651
RADIO CABINET
Robert F. Zivica, Walnut Creek, Calif., assignor to Pro Sports Marketing, Inc., Concord, Calif.
Filed Apr. 28, 1976, Ser. No. 681,254
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—69



248,652
PORTABLE RADIO
Shuhei Taguchi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 18, 1976, Ser. No. 668,119
Claims priority, application Japan, Sep. 19, 1975, 50-38365
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

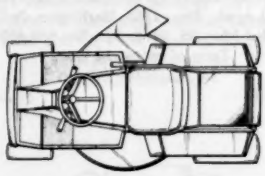


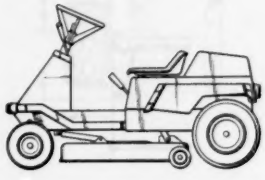
248,653
RADIO COMMUNICATION TRANSMITTER
Hiroshi Hirasa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 18, 1976, Ser. No. 668,001
Claims priority, application Japan, Sep. 19, 1975, 50-38364
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—95



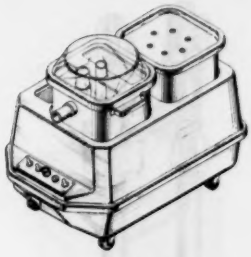
248,654
CULTIVATOR
Walter F. Ruhl, Greenville, and Robert R. Yeager, Union City, both of Ohio, assignors to Lambert Corporation, Dayton, Ohio
Filed Jun. 3, 1977, Ser. No. 803,392
Term of patent 14 years
Int. Cl. D15—*03;* D8—*01*
U.S. Cl. D15—12

248,655
LAWN MOWER-TRACTOR
Edward Klein, Wilmette, Ill., assignor to J. I. Case Company, Racine, Wis.
Filed Dec. 16, 1976, Ser. No. 751,515
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—15

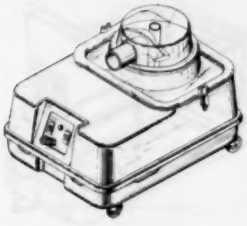




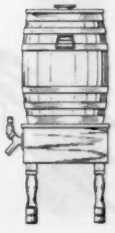
248,656
HOT-WATER EXTRACTION UNIT
Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.
Filed Apr. 7, 1976, Ser. No. 674,461
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



248,657
HOME VACUUM/WATER EXTRACTION CLEANING UNIT
Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.
Filed Apr. 6, 1977, Ser. No. 785,151
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



248,658
WINE CASK
Herman L. Buffington, 4372 NE. 11th Ave., Ft. Lauderdale, Fla. 33334
Filed Sep. 7, 1976, Ser. No. 720,791
Term of patent 14 years
Int. Cl. D15—*08;* D9—*02*
U.S. Cl. D15—114

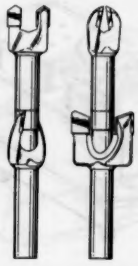


248,659

BORING BIT

Michael Schneider, Sr., 1120 S. Union Ave., Alliance, Ohio 44601

Filed Sep. 27, 1976, Ser. No. 727,151
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139

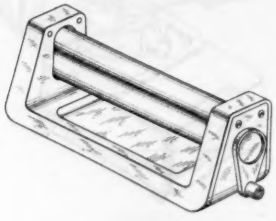


248,660

PHOTOGRAPHIC PRINT DRYING APPARATUS

Morris Gary Grossman, Wyckoff, N.J., and Edward D. Levy, Spring Valley, N.Y., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Filed Jul. 1, 1976, Ser. No. 701,625
Term of patent 14 years
Int. Cl. D16—*04;* D27—*99*
U.S. Cl. D16—33



248,661

COMBINED TOOL FOR HOLDING A KEEL AND A LAYOUT PENCIL

Donald S. Kanawyer, 2603 Elliot St., Santa Clara, Calif. 95051

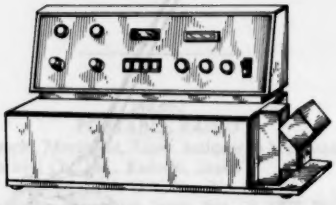
Filed Jul. 26, 1976, Ser. No. 708,411
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

248,662

NEPHELOMETER

James G. Bruni, 736 B Center Pl., Manhattan Beach, Calif. 90266; George M. Coker, Jr., 1324 Chilton Dr., Silver Spring, Md. 20904; Stephen G. Hauser, 4133 Aleman Dr., Tarzana, Calif. 91356; Keith S. Keith, 21566 Summit Trail, Topanga, Calif. 90290; Paul Priarone, 3106 Gumwood Dr., West Hyattsville, Md. 20783, and Rodolfo R. Rodriguez, 5482 Greathead Ct., Columbia, Md. 21045

Filed Dec. 11, 1975, Ser. No. 640,103
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



248,663

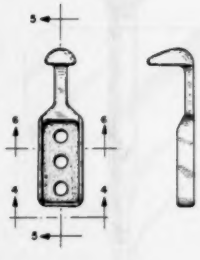
MANUAL DENTAL MODEL REMOVER

Edward Gorrell Apple, Box. 1155, Burlington, N.C. 27215

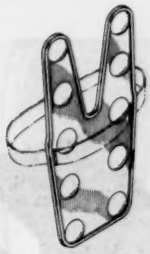
Filed Mar. 15, 1976, Ser. No. 666,659
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—10

248,664
ENDOSCOPE
Nagashige Takahashi, No. 28-10, 3-chome, Tokiwadai, Itabashi-ku, Tokyo, Japan
Filed Oct. 12, 1976, Ser. No. 731,480
Claims priority, application Japan, Apr. 22, 1976, 51-14809
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—18

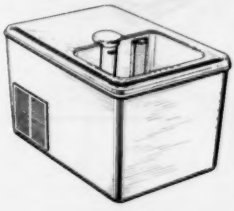
248,665
TEMPOROMANDIBULAR JOINT PROSTHESIS
Charles Albert Homsy, 11526 Raintree Cir., Houston, Tex. 77024, and John N. Kent, 5901 Wheeler, Metaire, La. 70003
Filed Jul. 12, 1976, Ser. No. 704,135
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



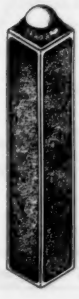
248,666
BACK MASSAGER ATTACHMENT
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Mar. 24, 1976, Ser. No. 669,980
Term of patent 14 years
Int. Cl. D28—*03;* D21—*02;* D24—*99*
U.S. Cl. D24—36



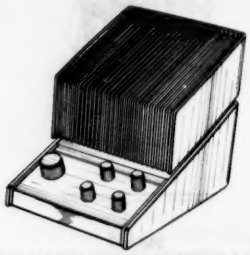
248,667
HYDROTHERAPEUTIC APPARATUS
Jerome R. Plugge, Rte. 50, Skipton, Cordova, Md. 21625
Filed Aug. 13, 1976, Ser. No. 704,435
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—38



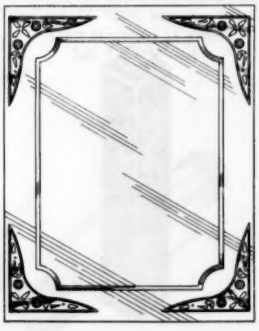
248,668
ACUPRESSURE THERAPEUTIC MESSAGE DEVICE
John Baptist Brehm, 918 W. Culver, Phoenix, Ariz. 85007
Filed Jul. 22, 1977, Ser. No. 818,276
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



248,669
ELECTRONIC SOUND CONDITIONING DEVICE
Roger Ramsey, Akron, Ohio assignor to Marpac Corporation, Wilmington, N.C.
Filed Jun. 27, 1977, Ser. No. 810,021
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99



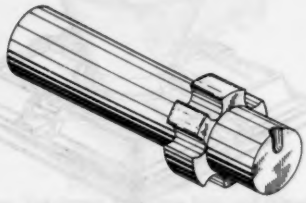
248,670
VITREOUS PANEL FOR A STORM DOOR OR THE LIKE
Michael March, 2594 Fernwood Ave., Roslyn, Pa. 19001
Filed Jan. 5, 1976, Ser. No. 646,635
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—72



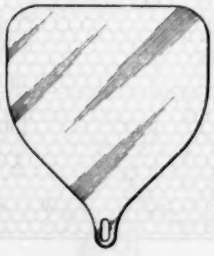
248,671
SMOKING DEVICE
Roger Graham, 931 Selim Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,702
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

248,672
MOUTHPIECE FOR A SMOKING DEVICE
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,722
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—05

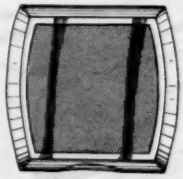
248,673
FILTER ELEMENT FOR A CIGARETTE HOLDER OR THE LIKE
Leslie N. Aikman, 3628 Ocean Blvd., Corona Del Mar, Calif. 92625
Filed Oct. 7, 1976, Ser. No. 730,539
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—7



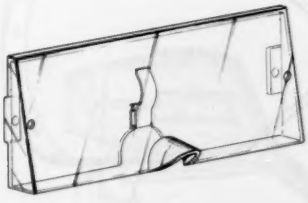
248,674
FACE SHIELD
Thomas Hannon, Rte. 5, Walnut Rd., Lockport, Ill. 60441
Filed Oct. 6, 1975, Ser. No. 620,178
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—9



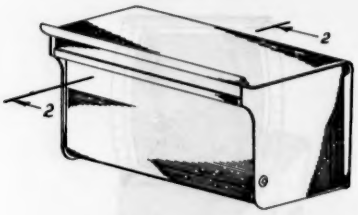
248,675
POWDER-BOX
Xavier C. M. Gaudiche, Paris, France, assignor to Reboul-Sofra S.A., Paris, France
Filed Apr. 20, 1976, Ser. No. 678,491
Claims priority, application France, Oct. 24, 1975, 75 38623
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—78



248,676
OUTDOOR RECEPTACLE FOR RECEIVING UTILITY BILLS AND THE LIKE
Harold F. Eichacker, 23 Churchill Rd., Wethersfield, Conn. 06109, and Richard F. Eichacker, 5 Claire Rd., Vernon, Conn. 06066
Filed Feb. 17, 1977, Ser. No. 769,427
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24

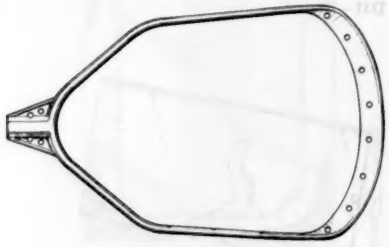


248,677
MAIL BOX
Charles A. Masso, 450 Erie St., Edinboro, Pa. 16412
Filed May 2, 1977, Ser. No. 792,816
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24

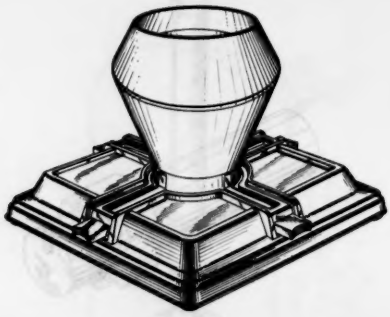


248,678
MARIONETTE
Charles R. Nagy, 750 Pleasant Ave., Kalamazoo, Mich. 49008
Filed Nov. 8, 1976, Ser. No. 739,422
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 A

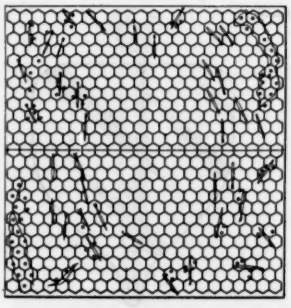
248,679
LACROSSE STICK HEAD
Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Co., Needha, Mass.
Filed Dec. 6, 1976, Ser. No. 747,950
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CT



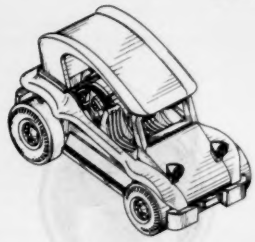
248,680
MARBLE DISPENSING GAME APPARATUS
Jane Waski, New York, N.Y., assignor to Janys Designs Limited, New York, N.Y.
Filed Dec. 16, 1976, Ser. No. 751,764
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



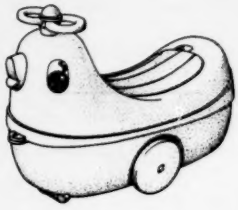
248,681
GAME BOARD
James Neal Harvey, 73 Maltbie Ave., Stamford, Conn. 06905
Filed Dec. 9, 1976, Ser. No. 748,728
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,682
TOY AUTO
Helmut Darda, 7712 Blumberg, Im Tal, Germany
Filed Dec. 17, 1975, Ser. No. 641,571
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

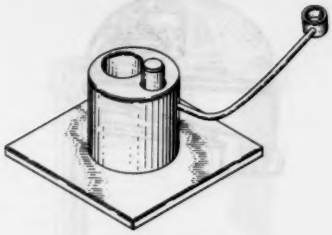


248,683
TOY VEHICLE
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 16, 1976, Ser. No. 696,651
Claims priority, application Japan, Feb. 19, 1976, 51/5375
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM

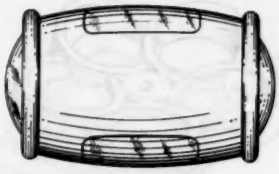


248,684
TOY MUSIC BOX
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,854
Claims priority, application Japan, Jul. 29, 1976, 51/29702
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

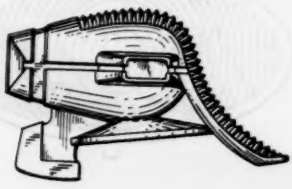
248,685
MANUALLY OPERABLE BALL TOSSING GAME APPARATUS
Rex K. Brown, 1611 Fallen Leaf La., Los Altos, Calif. 94022
Filed Dec. 17, 1976, Ser. No. 751,315
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



248,686
INFLATABLE EDUCATIONAL TOY
Sheldon Greenberg, 1107 Broadway, New York, N.Y. 12204
Filed Jan. 3, 1977, Ser. No. 756,185
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 DD



248,687
TOY ROBOT HEAD
Edward B. Bretschger, Cos Cob, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 10, 1977, Ser. No. 767,417
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD



248,688

TOY ROBOT HEAD

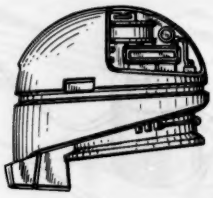
John A. Vernon, Jr., Bethel, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.

Filed Feb. 10, 1977, Ser. No. 767,419

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 AD



248,689

BUOYANT WICK HOLDER

Donald James Maxwell, London, England, assignor to Rizla Limited, Pontypridd, Wales

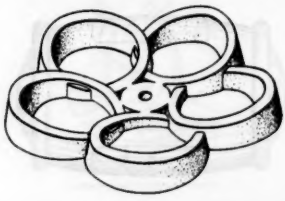
Filed Sep. 20, 1976, Ser. No. 724,938

Claims priority, application United Kingdom, Jul. 13, 1976, 97645007/76

Term of patent 14 years

Int. Cl. D26—*01*

U.S. Cl. D48—2



248,690

COMBINED STOP AND TAIL LAMP LENS

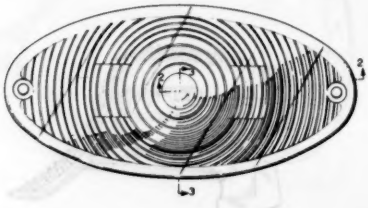
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada

Continuation of Ser. No. 430,200, Jan. 2, 1974, abandoned. This application Jun. 17, 1975, Ser. No. 587,609

Term of patent 14 years

Int. Cl. D26—*06*

U.S. Cl. D48—32 A



248,691

HEADLIGHT

Pierre Cibie, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Jul. 15, 1976, Ser. No. 705,387

Claims priority, application France, Apr. 15, 1976, 76 39135

Term of patent 14 years

Int. Cl. D26—*06*

U.S. Cl. D48—32 R

248,692

COIN ACCEPTOR OR SIMILAR ARTICLE

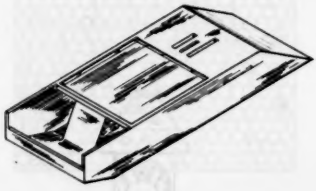
Henry Charles Kovar, Anoka, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Dec. 5, 1975, Ser. No. 638,025

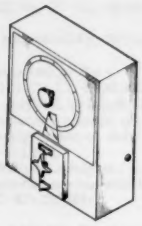
Term of patent 14 years

Int. Cl. D20—*01*

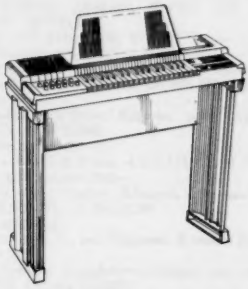
U.S. Cl. D52—3 R



248,693
VENDING MACHINE
Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064
Filed Aug. 12, 1976, Ser. No. 713,944
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R



248,694
ELECTRIC ORGAN
Marisa Bontempi, Montelupone (Macerata), Italy, assignor to COMUS S.p.A., Potenza Picena (Macerata), Italy
Filed May 4, 1976, Ser. No. 683,154
Claims priority, application Italy, Oct. 2, 1975, 22396-B/75
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



248,695
ELECTRONIC CALCULATOR
Teisuke Kurosu, Chofu; Eiji Fujita, Yokohama; Hisatoshi Matsushima, Yokohama, and Hiroshi Yonekura, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 26, 1977, Ser. No. 828,116
Claims priority, application Japan, Mar. 15, 1977, 52/9413
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Jer Engineering, Inc.: *See—*
Shulman, Abe; and Willing, Jere J., 4,102,367, Cl. 141-231.000.

A-T-O Inc.: *See—*
Puskarz, Stanley J., 4,102,366, Cl. 141-150.000.

Abar Corporation: *See—*
Kreider, Benjamin A.; and Metalsky, William J., 4,102,637, Cl. 432-227.000.

ABC Packaging Machine Corporation: *See—*
Reichert, Donald G., 4,102,252, Cl. 93-36.300.

Abe, Michiharu; and Oride, Akiyoshi, to Ricoh Co., Ltd. Thermoplastic recording members containing silicone oil, fluorocarbon oil or chlorofluorocarbon oil having improved deformation properties of surface. 4,103,071, Cl. 428-421.000.

Aberson, Gerhard M.; and Stulgate, Emily M., to Johnson & Johnson. Absorbent panel having densified portion with hydrocolloid material fixed therein. 4,103,062, Cl. 428-283.000.

Abex Corporation: *See—*
Benson, William Joseph, 4,102,607, Cl. 417-222.000.
Kohler, William H.; Mulder, James P.; and Meslink, Michael C., 4,102,443, Cl. 188-218.0XL.

Abler, Norman Christian, to Bunker Ramo Corporation. Contour shear device for pile fabrics. 4,102,023, Cl. 26-16.000.

Abrahamsson, Axel B.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.

Acosta Mira, Jose E., to Laboratorios Landerlan, S. A. Triterpene derivatives. 4,103,019, Cl. 424-274.000.

Acuity Systems, Incorporated: *See—*
Lapornik, Edward F.; and Rife, Douglas D., 4,102,575, Cl. 356-125.000.

Adachi, Seya: *See—*
Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya, 4,103,278, Cl. 340-1.00R.

Adachi, Shinichiro: *See—*
Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.

Adair, Lyles C.: *See—*
Dildy, Clell A., Jr.; and Adair, Lyles C., 4,103,279, Cl. 340-3.00D.

Adam, Erik, to Airco, Inc. Composite monolithic low-loss superconductor for power transmission line. 4,103,075, Cl. 428-614.000.

Adams, Richard R., to Chromalloy American Corporation. Safety boot with metatarsal protection. 4,102,062, Cl. 36-72.00R.

Aerazur Constructions Aeronautiques: *See—*
Bernard, Jean-Paul; and Meningand, Paul Albert, 4,102,518, Cl. 244-110.00C.

Aeschlimann, Peter: *See—*
Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, 4,102,639, Cl. 8-1.00A.

AGA Navigation Aids Ltd.: *See—*
Spottiswoode, Nigel Lawrence; and Ryden, David John, 4,103,172, Cl. 250-462.000.

Agence Nationale de Valorisation de la Recherche: *See—*
Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Orthmann, Jurgen, 4,103,159, Cl. 250-315.00R.

Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., to General Tire & Rubber Company, The. Cast annular laminates and method and apparatus for making same. 4,102,971, Cl. 264-255.000.

Air Industrie: *See—*
Cordier, Andre Guy; and Stockholm, John George, 4,102,303, Cl. 118-326.000.

Air Products & Chemicals, Inc.: *See—*
Bartish, Charles M., 4,102,920, Cl. 260-532.000.
Bartish, Charles M., 4,102,921, Cl. 260-532.000.
Hart, William A.; and Klinikowski, James J., 4,103,296, Cl. 340-309.100.

Airco, Inc.: *See—*
Adam, Erik, 4,103,075, Cl. 428-614.000.
Vandervelden, C. Keith; and Blake, William P., 4,103,324, Cl. 363-89.000.

Airheart Products, Inc.: *See—*
Wood, William H., 4,102,440, Cl. 188-72.700.

Ajax Tool Works, Inc.: *See—*
Benedict, Neil W.; and White, Robert J., 4,102,534, Cl. 173-137.000.

Ajinomoto Co. Inc.: *See—*
Kida, Takao; Mizuno, Hiroshi; and Okutsu, Masaru, 4,102,672, Cl. 71-106.000.

Akagane, Katsuo: *See—*
Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, 4,102,944, Cl. 260-861.000.

Akiyama, Masaki; and Tani, Okie, to Tani Denki Kogyo Kabushiki Kaisha. Switching signal generator. 4,103,105, Cl. 179-1.0VC.

Akiyama, Taichiro; Ookubo, Sajiro; and Ueno, Setsuko, to Taichiro Akiyama. Valved device. 4,102,342, Cl. 128-325.000.

Akizuki, Hiroyuki: *See—*
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,102,813, Cl. 252-430.000.

Aktiebolaget Atomenergi: *See—*
Margen, Peter Heinrich Erwin, 4,102,134, Cl. 61-1.00F.

Aktieselskabet Niro Atomizer: *See—*
Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, 4,102,056, Cl. 34-10.000.

Akzona Incorporated: *See—*
Penton, Harold Roy, Jr.; and Wagener, Kenneth Boone, 4,102,867, Cl. 528-289.000.

Albano, Robert Norman. Knockdown support and spacer for bookshelves. 4,102,525, Cl. 248-174.000.

Albarran, Jose F.; and Hamade, Adib R., to National Semiconductor Corporation. Low power JFET switch. 4,103,186, Cl. 307-251.000.

Albright, Roy H.; and Kelly, Walter B., to Gould Inc. High voltage grounding switch requiring low operating effort. 4,103,122, Cl. 200-48.00P.

Alcorn, Arnold B., to Warner & Swasey Company, The. Cutting tool. 4,102,591, Cl. 407-100.000.

Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, to Imperial Chemical Industries Limited. Pharmaceutical compositions. 4,103,023, Cl. 424-279.000.

Alexander, Andrew, to Aluminum Company of America. Low temperature vapor sealing of anodized aluminum. 4,103,048, Cl. 427-248.00R.

Alexander, Dewey D. Gripping pry tools for dislodging concrete forms and the like. 4,102,527, Cl. 254-131.000.

Alfa Skofabrik A/S: *See—*
Ihlen, Jacob, 4,102,063, Cl. 36-117.000.

Allegheny Ludlum Industries, Inc.: *See—*
Deverell, Harry E., 4,102,677, Cl. 75-128.00A.
Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, 4,102,713, Cl. 148-113.000.

Allen, Archelaius Dawson, to Gullick Dobson Limited. Self-advancing mine roof supports. 4,102,140, Cl. 61-45.00D.

Allen, Bobbie J.: *See—*
Wagner, Eugene R.; and Allen, Bobbie J., 4,103,027, Cl. 424-309.000.
Wagner, Eugene R.; and Allen, Bobbie J., 4,103,029, Cl. 424-318.000.

Allen-Bradley Company: *See—*
Karakis, Thomas G.; and Klotz, Clayton J., 4,103,136, Cl. 200-302.000.

Allen, Robert J.: *See—*
Petrow, Henry G.; and Allen, Robert J., 4,102,819, Cl. 252-460.000.

Alles, Hans-Ulrich: *See—*
Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.

Alliance Manufacturing Company, The: *See—*
Deming, Andrew F.; and Russell, James B., 4,103,238, Cl. 325-141.000.

Allied Chemical Corporation: *See—*
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,103,068, Cl. 428-395.000.

Allis-Chalmers Corporation: *See—*
Wristen, Cecil C., 4,103,141, Cl. 219-130.010.

Allsopp, Peter James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Electric furnaces. 4,103,099, Cl. 13-7.000.

Altorfer AG Metall- und Apparatebau: *See—*
Altorfer, Hans; and Knoll, Oscar, 4,102,541, Cl. 280-11.1BT.

Altorfer, Hans; and Knoll, Oscar, to Altorfer AG Metall- und Apparatebau. Roller skis. 4,102,541, Cl. 280-11.1BT.

Aluminum Company of America: *See—*
Alexander, Andrew, 4,103,048, Cl. 427-248.00R.

Amakata, Hajime: *See—*
Nakamura, Masahiro; Tsuda, Tetsuaki; and Amakata, Hajime, 4,102,772, Cl. 204-206.000.

Amana Refrigeration, Inc.: *See—*
Copping, John R.; and Foerstner, Richard A., 4,102,041, Cl. 29-600.000.

Amberg, Stephen W.; and Spicer, John F., to Owens-Illinois, Inc. Adhesive applicator device. 4,102,302, Cl. 118-239.000.

Ambrosini, Leonard R.: *See*—
Magarian, Robert F.; Ambrosini, Leonard R.; and Isenson, Raymond S., 4,102,241, Cl. 89-155.000.

Amchem Products, Inc.: *See*—
Nishida, Takao; and Tonoike, Kiyoshi, 4,103,049, Cl. 427-341.000.

Amerace Corporation: *See*—
Goldberg, Bruce S., 4,102,746, Cl. 195-63.000.
Johnson, Glenn W., Jr.; and Lindlau, Paul F., 4,102,286, Cl. 113-119.000.

Amerada Hess Corporation: *See*—
Young, Richard W., 4,102,789, Cl. 210-252.0AS.

American Can Company: *See*—
Meyers, George Leroy, 4,102,457, Cl. 206-611.000.

American Chemical and Refining Company Incorporated: *See*—
Moriarty, William L.; and Zobbi, Robert G., 4,102,770, Cl. 204-195.00R.

American Communication Systems, Inc.: *See*—
Milkes, Paul, 4,103,115, Cl. 179-90.00B.

American Cyanamid Company: *See*—
Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,103,028, Cl. 424-315.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,102,917, Cl. 260-506.000.
Dzurik, John A., 4,102,738, Cl. 162-117.000.
Siuta, Gerald Joseph; and Bernstein, Seymour, 4,102,918, Cl. 260-507.00R.

American Hoist & Derrick Company: *See*—
Crook, Edward J., Jr.; and Garrett, Charles R., 4,102,295, Cl. 116-114.00R.
Thompson, Wallace M.; and Beeland, William D., 4,102,259, Cl. 100-3.000.

American Hospital Supply Corporation: *See*—
Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., 4,102,747, Cl. 195-103.50C.

American Optical Corporation: *See*—
Cannon, Robert Lee, III, 4,102,345, Cl. 128-419.0PT.
Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., 4,102,567, Cl. 351-160.000.

Ammons, Vernon G., to PPG Industries, Inc. Safety glass laminates with aliphatic/cycloaliphatic polycarbonate urethanes. 4,103,070, Cl. 428-412.000.

Amortegui, Carlos. Force transmitting means. 4,102,211, Cl. 74-66.000.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Capillary tube pen point. 4,102,584, Cl. 401-259.000.

Anders, Edward O., to Global Marine, Inc. Method and apparatus for protecting offshore structures against forces from moving ice sheets. 4,102,144, Cl. 61-103.000.

Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., to GTE Automatic Electric Laboratories Incorporated. Dual coil hinged bobbin assembly. 4,103,268, Cl. 336-208.000.

Anderson, Antony Faithfull, to Reyrolle Parsons Limited. Voltage generators. 4,103,194, Cl. 310-68.00D.

Anderson, James Hilbert. Multiple well dual fluid geothermal power cycle. 4,102,133, Cl. 60-641.000.

Anderson, James Ralph. Roll holder means. 4,102,510, Cl. 242-55.200.

Andrade, Ralph W.; and Duncan, Alexander W., to GTE Sylvania Incorporated. Pin inserting apparatus. 4,102,043, Cl. 29-739.000.

Andre, William L., to United States of America, Army. Counting device impulse activator with torque limiter. 4,102,074, Cl. 42-1.00E.

Andros, Incorporated: *See*—
McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,103,174, Cl. 250-493.000.

Angarola, Barry R.: *See*—
Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., 4,102,364, Cl. 141-4.000.

Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, to Aktieselskabet Niro Atomizer. Method and apparatus for introducing a particulate or pulverulent material into a flow of gas. 4,102,056, Cl. 34-10.000.

Anglin, Noah L.; and Berry, Robert H., to Information Terminals Corporation. Tensioning means for belt driven tape cassette. 4,102,516, Cl. 242-199.000.

Anguish, Jerry Lee, to Butler Ventamatic Corp. Roof flange for horizontal pipes. 4,102,090, Cl. 52-58.000.

Annas, Dulin Land, Sr., to Speizman Industries, Inc. Apparatus for handling stockings. 4,102,729, Cl. 156-384.000.

Annen, Klaus: *See*—
Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,102,908, Cl. 260-397.400.

Antlfinger, George John; and Seletzky, Peter Dresel, to B. F. Goodrich Company, The. Heat sensitive latices. 4,102,841, Cl. 260-29.60N.

Aoki, Tsunetaka, to Yoshida Kogyo K.K. Automatically locking slider for slide fasteners. 4,102,022, Cl. 24-205.14R.

Aoyagi, Yoshiaki: *See*—
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.

Apfelbaum, Jerome G.: *See*—
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,102,256, Cl. 99-372.000.

Arai, Haruhiko: *See*—
Minegishi, Yutaka; and Arai, Haruhiko, 4,102,795, Cl. 252-8.900.

Arcanum Corporation: *See*—
Caswell, Bruce F., 4,102,968, Cl. 264-117.000.

Archer, Robert A.; and Day, William A., to Eli Lilly and Company. Stereoselective preparation of hexahydro dibenzopyranones and intermediates therefor. 4,102,902, Cl. 260-345.300.

Arco Polymers, Inc.: *See*—
Straka, Daniel Charles, 4,102,808, Cl. 252-354.000.

Argus Chemical Corporation: *See*—
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,102,815, Cl. 252-426.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,102,858, Cl. 260-45.80N.

Arita, Yasunobu: *See*—
Iida, Takahiko; and Arita, Yasunobu, 4,103,258, Cl. 331-111.000.

Ariyan, Zaven S.: *See*—
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,103,016, Cl. 424-270.000.

Armco Steel Corporation: *See*—
Taylor, Donald M.; and Ward, Donald H., 4,102,105, Cl. 52-520.000.

Armstrong, Douglas, to Coulter Electronics, Inc. Stabilized hematological reagent solutions. 4,102,810, Cl. 252-408.00R.

Arnold, Dan M.: *See*—
Dowling, Donald J.; and Arnold, Dan M., 4,102,185, Cl. 73-155.000.

Aron S.A.R.L.: *See*—
Sterne, Jean-Jacques, 4,103,010, Cl. 424-250.000.

Arrow Pneumatic, Inc.: *See*—
Draxler, Walter E., 4,102,473, Cl. 220-319.000.

Arvela, Aukusti, to L.A. Levanto Oy. Powder metallurgic manufacturing process. 4,102,679, Cl. 75-226.000.

Asahi-Dow Limited: *See*—
Watanabe, Seizaburo; Hattori, Eiji; and Mori, Kanau, 4,102,829, Cl. 521-81.000.

ASEA AB: *See*—
Hammarlund, Gudmar, 4,102,198, Cl. 73-362.0AR.

ASEA Aktiebolag: *See*—
Thenander, Rune, 4,102,183, Cl. 73-144.000.

Ashley, Eugene, to General Electric Company. Liquid propellant weapon system. 4,102,269, Cl. 102-38.0LP.

Ashmead, Harvey H. Composition for improving biologic development. 4,103,003, Cl. 424-177.000.

Asperger, Robert G.: *See*—
Clouse, Robert C.; and Asperger, Robert G., 4,102,804, Cl. 252-189.000.

Assmus, Friedrich: *See*—
Flaig, Hans; and Assmus, Friedrich, 4,102,120, Cl. 58-38.00R.

Astec Industries, Inc.: *See*—
Brock, James Donald; and Mize, Erbie Gail, 4,103,350, Cl. 366-22.000.

Astro Development Corporation: *See*—
Cratty, Charles J., 4,103,352, Cl. 366-39.000.

Atari, Inc.: *See*—
Van Jepmond, Howard K.; and Milner, Ronald E., 4,102,532, Cl. 273-1.00E.

Ateliers de Constructions Mecaniques Seailles et Tison: *See*—
Jiminez, Pedro, 4,102,531, Cl. 270-79.000.

Atkins, Ronald L.: *See*—
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,256, Cl. 331-94.50L.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,257, Cl. 331-94.50L.

Atlantic Richfield Company: *See*—
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.
Dransfield, Clifford D., 4,102,429, Cl. 181-117.000.

Atlas Copco Aktiebolag: *See*—
Lagerstedt, John Arne, 4,102,409, Cl. 173-50.000.

Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for preparing α-amino-β'-nitroanthraquinones. 4,102,906, Cl. 260-382.000.

Augier, Robert Joseph Ernest; and Eliche, Jean Marc, to Societe Anonyme de Recherche et d'Etudes Techniques. Manufacturing benches for moulded construction. 4,102,618, Cl. 425-64.000.

Auinger, Herbert; Lang, Walter; and Mader, Manfred, to Siemens Aktiengesellschaft. Brushless synchronous generator with an exciter. 4,103,217, Cl. 322-28.000.

Auriemma, Robert Sinbad. Underground drainage pipe. 4,102,135, Cl. 61-10.000.

Autoipari Kutato Intezet: *See*—
Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, 4,102,181, Cl. 73-119.00A.

Autovox S.p.A.: *See*—
Cicatelli, Rodolfo, 4,102,517, Cl. 242-201.000.

Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, to Sandoz Ltd. Pyrazole derivatives. 4,102,857, Cl. 260-45.80N.

Avion Australia Pty Ltd.: *See*—
Holland, John Anthony, 4,101,990, Cl. 5-63.000.

Avions Marcel Dassault-Breguet Aviation: *See*—
Levy, Fernand Jacques, 4,103,055, Cl. 428-113.000.

Avon Products, Inc.: *See*—
Tuffile, Fred M.; and Cunningham, Andrew J., 4,102,641, Cl. 8-10.100.

Ayers, Orval E.: *See*—
Martignoni, Pasquale; Murfree, James A., Jr.; Chew, William M.; and Ayers, Orval E., 4,102,988, Cl. 423-483.000.

B. F. Goodrich Company, The: *See*—
Antlfinger, George John; and Seletzky, Peter Dresel, 4,102,841, Cl. 260-29.60N.

Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, 4,102,935, Cl. 260-656.00R.
Lee, Maw-Huei, 4,103,283, Cl. 340-58.000.
Magistro, Angelo Joseph, 4,102,936, Cl. 260-656.00R.

Baba, Takashi; Hunahashi, Susumu; and Kawabata, Toshihiko, to Kubota Ltd. Apparatus for removing solids deposited on inner surface of rotary kiln. 4,102,001, Cl. 15-104.10C.

Babcock & Wilcox Company, The: *See*—
Thomasson, Frederick Young, 4,103,161, Cl. 250-336.000.

Bach, Guido: *See*—
Luthi, Fritz; and Bach, Guido, 4,102,625, Cl. 425-464.000.

Badger, John P.; and Rinker, Jack R., to Eltra Corporation. Method and apparatus for making flattened expanded lead strip for battery plates. 4,102,024, Cl. 29-6.200.

Baessler, Konrad: *See*—
Volkwein, Gert; and Baessler, Konrad, 4,102,927, Cl. 260-581.000.

Bahls, Harry, to Peacock Industries, Inc. Composition and method for applying metallic silver to a substrate. 4,102,702, Cl. 106-1.230.

Bahraman, Ali; and Crandall, Walter E., to Northrop Corporation. High speed electron beam semiconductor digital multiplexer. 4,103,111, Cl. 179-15.00A.

Bailey, Edward A.; and Ordway, James F., to Joy Manufacturing Company. Drilling apparatus. 4,102,414, Cl. 175-85.000.

Bailey, Terry R.: *See*—
Bingham, Wallace Karl; and Bailey, Terry R., 4,103,060, Cl. 428-241.000.

Baker, John E.; and Shackford, Charles C., to Reynolds Metals Company. Apparatus for and method of heat curing electrical insulation provided on a central electrical conductor of an electrical cable. 4,102,955, Cl. 264-25.000.

Bakerdrill Inc.: *See*—
Kammerer, Archer W., Jr., 4,102,418, Cl. 175-324.000.

Balaspiri, Lajos: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1,2,4-Triazoles. 4,102,889, Cl. 260-296.00R.

Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, to Commonwealth Scientific and Industrial Research Organization. Reciprocatory piston and cylinder machines. 4,102,608, Cl. 417-242.000.

Baltsch, Erwin: *See*—
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.

Banks, John B. Treatment of fabric comprising cotton or keratinous fibers for shrink resistance. 4,102,642, Cl. 8-125.000.

Bannock, Roy Robert: *See*—
Couston, Frederick Robert; and Bannock, Roy Robert, 4,102,210, Cl. 73-727.000.

Baratto, Eugene L.; and Dupre, Eugene J., to Minnesota Mining and Manufacturing Company. Resilient wood replication. 4,103,056, Cl. 428-142.000.

Barbano, Normand: *See*—
Regenos, Kenneth M.; and Barbano, Normand, 4,103,303, Cl. 343-100.0SA.

Barber, Charles R., to Raymond Lee Organization, Inc., The, a part interest. Coffee pot perk alarm. 4,102,294, Cl. 116-103.000.

Barbush, Joseph F., to Taradash, Allen. Theft prevention apparatus for a motor vehicle. 4,102,164, Cl. 70-241.000.

Bardenheuer, Friedrich; and Kolb, Gustav, to Mannesmann Aktiengesellschaft; and Kolb, Gustav, part interest to each. Sampling molten steel. 4,102,197, Cl. 73-354.000.

Barehas, Myron. Pressure sensitive laminate and method of forming same. 4,103,053, Cl. 428-40.000.

Barker, Charles L.: *See*—
Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., 4,102,270, Cl. 102-49.500.

Barker, Frank S.; and Pehl, Willis G., to Shakertown Corporation. Prefabricated shingle panels. 4,102,107, Cl. 52-553.000.

Barrow, Thomas: *See*—
Owen, Harry; and Barrow, Thomas, 4,102,693, Cl. 106-54.000.

Bartish, Charles M., to Air Products & Chemicals, Inc. Production of carboxylic acids and esters. 4,102,920, Cl. 260-532.000.

Bartish, Charles M., to Air Products & Chemicals, Inc. Production of carboxylic acids and esters. 4,102,921, Cl. 260-532.000.

Barton, James Brockman, to Texas Instruments Incorporated. Zig-zag SPS CCD memory. 4,103,347, Cl. 365-219.000.

BASF Aktiengesellschaft: *See*—
Baumann, Hans, 4,102,879, Cl. 260-149.000.
Hartmann, Heinrich; and Sander, Hans, 4,102,847, Cl. 260-31.40R.
Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, 4,102,871, Cl. 528-324.000.

Batchelor, John Frederick: *See*—
Hodson, Harold Francis; and Batchelor, John Frederick, 4,103,015, Cl. 424-269.000.

Battigelli, Jean A.: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,102,662, Cl. 65-5.000.

Baudin, Pol: *See*—
Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.

Baulig, Klaus-Peter: *See*—
Haas, Helmut; and Baulig, Klaus-Peter, 4,102,589, Cl. 403-373.000.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Aliphatic amido-quaternary ammonium anti-microbial compounds. 4,102,994, Cl. 424-54.000.

Baumann, Friedrich; and Ulrich, Max Bernhard. Hip-joint prosthesis. 4,101,985, Cl. 3-1.912.

Baumann, Hans, to BASF Aktiengesellschaft. Unsymmetrical azomethine 1:2-chromium complex dyes. 4,102,879, Cl. 260-149.000.

Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, to Heraeus-Schott Quarzschmelze GmbH. Method of surface crystallizing quartz. 4,102,666, Cl. 65-33.000.

Baurecht, Heinz-Ewald; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Process for the preparation of copper phthylocyanine. 4,102,892, Cl. 260-314.500.

Bayer Aktiengesellschaft: *See*—
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,102,906, Cl. 260-382.000.
Baurecht, Heinz-Ewald; and Hornle, Reinhold, 4,102,892, Cl. 260-314.500.
Eimers, Erich; Dheim, Rolf; and Cohnen, Wolfgang, 4,102,859, Cl. 260-45.80A.
Kalk, Walter; Bien, Hans Samuel; and Schundehutte, Karl Heinz, 4,102,924, Cl. 260-562.00P.
Kubitzek, Harry; Feltgen, Karlheinz; and Rosendahl, Friedrich-Karl, 4,102,965, Cl. 264-103.000.
Schartau, Wolfgang; and Schwochow, Friedrich, 4,102,692, Cl. 106-50.000.
Schliebs, Reinhard; and Block, Hans-Dieter, 4,102,949, Cl. 260-985.000.
Scholl, Hans-Joachim; Markusch, Peter; and Dieterich, Dieter, 4,102,699, Cl. 106-84.000.
Schwinum, Ernst; Hornig, Heinz; and Matner, Martin, 4,102,844, Cl. 260-29.70T.
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.
Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.
Thom, Karl-Friedrich; Maass, Gunther; and Beck, Manfred, 4,102,940, Cl. 260-824.00R.
Timmler, Helmut; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,102,891, Cl. 260-308.00R.

Beach, Rex E.; and Blomgren, Roland A., to Service Master Industries, Inc. Tip device for a vacuum cleaner tank. 4,102,462, Cl. 214-301.000.

Beatrice Foods Co.: *See*—
Roberts, W. L., 4,103,038, Cl. 426-601.000.

Beaver, Danny D.: *See*—
Wendt, Michael E.; and Beaver, Danny D., 4,103,192, Cl. 310-64.000.

Beck, Kurt-Gunther, to Bergwerksverband GmbH. Method of and an arrangement for pre-heating coking coal. 4,102,635, Cl. 432-14.000.

Beck, Manfred: *See*—
Thom, Karl-Friedrich; Maass, Gunther; and Beck, Manfred, 4,102,940, Cl. 260-824.00R.

Beckett, Leo Gano; and Buchser, William J., to Whirlpool Corporation. Ice guide for refrigerator with external ice service. 4,102,660, Cl. 62-344.000.

Beckman Instruments, Inc.: *See*—
Chulay, Steven John, 4,102,490. Cl. 233-26.000.

Beecham Group Limited: *See*—
Davis, Walter Bryan, 4,102,992, Cl. 424-49.000.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,901, Cl. 260-345.80R.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,904, Cl. 260-345.70R.

Beeland, William D.: *See*—
Thompson, Wallace M.; and Beeland, William D., 4,102,259, Cl. 100-3.000.

Beers, Melvin D.: *See*—
DeLaTorre, Pearline; and Beers, Melvin D., 4,102,852, Cl. 260-37.0SB.

Bell, Cecil R., to Hanes Corporation. Method for closing end portions of tubular fabric articles. 4,102,727, Cl. 156-251.000.

Bell & Howell Limited: *See*—
Couston, Frederick Robert; and Bannock, Roy Robert, 4,102,210, Cl. 73-727.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bosik, Barry Sheldon, 4,103,114, Cl. 179-84.00R.
DeNigris, Ernest Gerard; and Olsen, Merle Victor, 4,103,126, Cl. 200-67.00C.
Dimmick, James Owen, 4,103,327, Cl. 364-200.000.
Dudderar, Thomas Dixon; and Simpkins, Peter Gerald, 4,102,661, Cl. 65-2.000.
Frank, Amalie Julianna, 4,103,287, Cl. 340-146.30H.
Klein, Theodore Harold, 4,103,102, Cl. 174-68.500.
Spollen, Francis Joseph, 4,103,104, Cl. 174-70.00S.

Bendix Corporation, The: *See*—
Colpaert, James J., 4,102,442, Cl. 188-206.00A.
Fahim, Magdi M.; and Marscher, William D., 4,102,315, Cl. 123-124.00B.
Jackson, Harold Wofford, 4,103,250, Cl. 331-1.00A.
Whiteside, Arliss Eugene, 4,103,337, Cl. 364-900.000.

Benedict, Neil W.; and White, Robert J., to Ajax Tool Works, Inc. Pneumatic hammer. 4,102,534, Cl. 173-137.000.

Benson, William Joseph, to Abex Corporation. Fluid energy translating device. 4,102,607, Cl. 417-222.000.

Bentley, John; and Thompson, Morice William, to Imperial Chemical Industries Limited. Stable dispersions of polymer particles containing

sub-particles of a solid modifying agent and process for making same. 4,102,846, Cl. 260-31.20N.

Berger, Dieter: *See—*
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, 4,103,041, Cl. 427-2.000.

Bergh, Eugene H., to Minnesota Mining and Manufacturing Company. Hand tool for cutting ends of decorative molding. 4,102,045, Cl. 30-287.000.

Bergman, Jay Richard, to Synanon Foundation, Inc. Autobalance hybrid circuit. 4,103,118, Cl. 179-170.00D.

Bergwerksverband GmbH: *See—*
Beck, Kurt-Gunther, 4,102,635, Cl. 432-14.000.
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,102,138, Cl. 61-42.000.
Stalherm, Dieter; and Kolitz, Volker, 4,102,751, Cl. 202-151.000.

Berkowitz, Sidney, to FMC Corporation. Formation of crystalline [(mono-trichloro) tetra-(monopotassium dichloro)] penta-isocyanurate. 4,103,088, Cl. 544-190.000.

Berliet, Gerard: *See—*
Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.

Bernard, James I.: *See—*
Strom, Gerald A.; and Bernard, James I., 4,103,281, Cl. 340-18.0LD.

Bernard, Jean-Paul; and Meningand, Paul Albert, to Aerazur Constructions Aeronautiques. Aircraft arresting gear. 4,102,518, Cl. 244-110.00C.

Bernat, William M.: *See—*
Golder, Michael D.; and Bernat, William M., 4,102,106, Cl. 52-533.000.

Berniker, Burton M. Pneumatically driven devices. 4,102,249, Cl. 91-186.000.

Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, to American Cyanamid Company. Complement inhibitors. 4,103,028, Cl. 424-315.000.

Bernstein, Seymour: *See—*
Conrow, Ransom Brown; and Bernstein, Seymour, 4,102,917, Cl. 260-506.000.
Siuta, Gerald Joseph; and Bernstein, Seymour, 4,102,918, Cl. 260-507.00R.

Berry, Holland James; and Morgan, George W., to Sun Oil Company Limited. Operations vessel for ice covered seas. 4,102,288, Cl. 114-41.000.

Berry, Robert H.: *See—*
Anglin, Noah L.; and Berry, Robert H., 4,102,516, Cl. 242-199.000.

Berry, Robert W.: *See—*
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., 4,102,411, Cl. 173-164.000.

Berry, Ronald G. Teaching aid for reading an horological clock. 4,102,060, Cl. 35-39.000.

Berstermann, Wilhelm, to Klockner-Werke AG. Electrode for a spectro-analytical arrangement. 4,102,573, Cl. 356-86.000.

Bertin, Jacques, to Paulstra. Lip sealing ring for a shaft. 4,102,538, Cl. 277-153.000.

Bethlehem Steel Corporation: *See—*
Fradeneck, Ronald J.; and Biancarelli, Edmund J., 4,102,190, Cl. 73-302.000.

Bethmann, Karl-Wilhelm, to Rheinmetall GmbH. Armor-piercing tandem shell or projectile. 4,102,271, Cl. 102-52.000.

Betz Laboratories, Inc.: *See—*
Lange, K. Robert, 4,102,707, Cl. 134-22.00R.

Betz, Tilman, to Rohde and Schwarz. Sound level meter. 4,102,208, Cl. 73-647.000.

Beuther, Harold; Innes, Robert A.; and Swift, Harold E., to Gulf Research & Development Company. Process for preparing acrylonitrile. 4,102,914, Cl. 260-465.300.

Beutler, Robert Russel, to Motorola, Inc. Complementary power saving comparator/inverter circuits. 4,103,190, Cl. 307-362.000.

Bez, Eckhard: *See—*
Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, 4,102,608, Cl. 417-242.000.

Bhalla, Ranbir S., to Westinghouse Electric Corp. Arc tube end seal and method of forming. 4,103,200, Cl. 313-221.000.

Biancarelli, Edmund J.: *See—*
Fradeneck, Ronald J.; and Biancarelli, Edmund J., 4,102,190, Cl. 73-302.000.

Biehler, Jean Marie: *See—*
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.

Bien, Hans Samuel: *See—*
Kalk, Walter; Bien, Hans Samuel; and Schundehutte, Karl Heinz, 4,102,924, Cl. 260-562.00P.

Bindra, Jasjit S.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,102,894, Cl. 260-332.30R.

Bingham, Wallace Karl; and Bailey, Terry R., to Minnesota Mining and Manufacturing Company. Area-retroreflectorization of fabrics. 4,103,060, Cl. 428-241.000.

Bischoff, Guido, to Robert Bosch GmbH. Forced draft fan blade construction for dynamo electric machines and forced draft automotive alternator. 4,102,601, Cl. 416-183.000.

Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., to Lear Siegler, Inc. Pot broach. 4,102,244, Cl. 90-1.000.

Black Clawson Inc.: *See—*
Cage, Kenneth M.; and Turner, C. Warren, 4,102,232, Cl. 83-854.000.

Black, James A.: *See—*
Porth, Frank L., 4,102,266, Cl. 101-124.000.

Black, Sivalls & Bryson, Inc.: *See—*
Wood, Loren E.; and Short, Edward H., III, 4,102,167, Cl. 72-54.000.

Blair, Henry E.: *See—*
Charm, Stanley E.; and Blair, Henry E., 4,102,455, Cl. 206-569.000.

Blake, Raymond John. Bumper mounted vehicle obstacle detector. 4,103,284, Cl. 340-61.000.

Blake, William P.: *See—*
Vandervelden, C. Keith; and Blake, William P., 4,103,324, Cl. 363-89.000.

Blank, Paul C. Collapsible sawhorse. 4,102,434, Cl. 182-181.000.

Blase, Robert. Multi-track machine press. 4,102,174, Cl. 72-421.000.

Blaser, Anton J.: *See—*
Currie, Richard Kenneth, 4,102,028, Cl. 29-281.500.

Bloch, Heinz P., to Exxon Research & Engineering Co. Deflection indicator for couplings. 4,102,052, Cl. 33-180.00R.

Block, Hans-Dieter: *See—*
Schliebs, Reinhard; and Block, Hans-Dieter, 4,102,949, Cl. 260-985.000.

Blomgren, Roland A.: *See—*
Beach, Rex E.; and Blomgren, Roland A., 4,102,462, Cl. 214-301.000.

Bloomquist, Thomas N. Wet sanding device. 4,102,084, Cl. 51-170.0MT.

Blum, Jacques Marcel; and Ventre, Edmond, to Electricite de France (Service National); and Pechiney Ugine Kuhlmann. Moderator structure for the core of a molten salt reactor. 4,102,740, Cl. 176-84.000.

Blum, John H.: *See—*
Rockerath, John L.; and Blum, John H., 4,102,283, Cl. 112-131.000.

Blytas, George C., to Shell Oil Company. Heat recovery process. 4,102,388, Cl. 165-1.000.

Board, Lawrence: *See—*
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.

Board of Regents, University of Florida: *See—*
Hench, Larry Leroy; and Greenspan, David Charles, 4,103,002, Cl. 428-155.000.

Bobick, Thomas W., to Xerox Corporation. Capacitive touch-activated transducer system including a plurality of oscillators. 4,103,252, Cl. 331-48.000.

Bobylev, Semen Mikhailovich: *See—*
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Bobylev, Valery Semenovich: *See—*
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Boden, Ogden W. Ventilated hat or cap. 4,101,981, Cl. 2-182.600.

Boden, Ogden W. Locking assemblies which maintain bow loops in cords. 4,102,019, Cl. 24-117.000.

Bodor, Janos; van Heteren, Jan; and Verhagen, Laurentius Adrianus Maria, to Lever Brothers Company. Low fat spread. 4,103,037, Cl. 426-575.000.

Boehringer Mannheim GmbH: *See—*
Klose, Sigmar; and Hagen, Alexander, 4,102,742, Cl. 195-103.50R.
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, 4,103,041, Cl. 427-2.000.

Boelkow Entwicklungen KG: *See—*
Hermann, Joachim, 4,102,521, Cl. 244-3.110.

Boesel, Bradley W.: *See—*
Feary, Steven L.; and Boesel, Bradley W., 4,102,274, Cl. 105-367.000.

Bohm, Georg Gustav Anton; and Skutnik, Bolesh J., to Firestone Tire & Rubber Company, The. Radiation cure of synthetic rubbers. 4,102,761, Cl. 204-159.200.

Bohmer, Branislav; and Hoppe, Lutz, to Wolff Walsrode Aktiengesellschaft. Auxiliary agent for improving retention, drainage and treatment especially in papermaking, and use of the auxiliary agent. 4,103,080, Cl. 526-303.000.

Bokelman, Gordon Herman: *See—*
Mitscher, Lester Allen; Clark, George Winfred, III; and Bokelman, Gordon Herman, 4,103,091, Cl. 560-106.000.

Bokelmann, Horst, to Metzeler Schaum GmbH. Apparatus for producing foam slabs of rectangular cross-section. 4,102,619, Cl. 425-89.000.

Bolton, Theodore S.: *See—*
Matthews, Richard E.; and Bolton, Theodore S., 4,102,148, Cl. 62-77.000.

Boltswitch, Inc.: *See—*
Erickson, John Walter; and Erickson, John W., 4,103,133, Cl. 200-153.00N.

Bommer, Raymond: *See—*
Pellin, Henri Maurice, 4,102,654, Cl. 55-102.000.

Bonazoli, Robert P.: *See—*
Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., 4,103,277, Cl. 338-237.000.

Boni, Kenneth A., to Continental Group, Inc., The. Polyolefin contain-

ers having improved gas barrier properties. 4,102,974, Cl. 264-294.000.

Borg-Warner Corporation: *See—*
Harnish, James Ranck; and Raffensberger, Larry Allan, 4,102,390, Cl. 165-29.000.
Kountz, Kenneth John, 4,102,150, Cl. 62-209.000.
Miller, Alan Leonard; and Petzold, Werner Paul, 4,102,222, Cl. 74-866.000.
Volk, Joseph A., Jr., 4,102,055, Cl. 33-345.000.
Wills, Frank Eugene, 4,102,389, Cl. 165-29.000.

Borkowski, John W., to Stackpole Carbon Company. Process for making high strength flexible graphite foil. 4,102,960, Cl. 264-42.000.

Borom, Marcus P., to General Electric Company. Magnesia doped alumina core material. 4,102,689, Cl. 106-38.900.

Bosch, Karl. Device for securing skis and ski sticks. 4,102,163, Cl. 70-58.000.

Bosik, Barry Sheldon, to Bell Telephone Laboratories, Incorporated. Variable delay ringing detector. 4,103,114, Cl. 179-84.00R.

Bosso, Joseph F.: *See—*
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,102,863, Cl. 528-111.000.

Botts, Elton M., to Energy 76, Inc. Control unit for oil wells. 4,102,394, Cl. 166-65.00R.

Bouton, Thomas Chester; and Futamura, Shingo, to Firestone Tire & Rubber Company, The. Oil-extended hydrogenated diblock copolymer. 4,102,849, Cl. 260-33.6AQ.

Brackman, Derek Samuel, to Imperial Chemical Industries Limited. Joining method. 4,102,726, Cl. 156-244.110.

Bradley, Havyn E., to Hewlett-Packard Company. Programmable transfer gate array. 4,103,182, Cl. 307-203.000.

Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, to Glaxo Laboratories Limited. 7-(Carboxy substituted α-etherified oximino arylacetamido) cephalosporins having a 3-vinyl or substituted vinyl group. 4,103,084, Cl. 544-22.000.

Brahm, Charles B., to United Technologies Corporation. Temperature compensated vibrating cylinder pressure transducer. 4,102,209, Cl. 73-702.000.

Braitberg, Michael F., to Honeywell Inc. Error cancelling sync-off-tach tape drive system. 4,103,214, Cl. 318-326.000.

Braley, Gertrude. Thimble structure. 4,102,479, Cl. 223-101.000.

Brand, Arnold Joseph: *See—*
Naydan, Bob Nicholas; and Brand, Arnold Joseph, 4,103,215, Cl. 318-654.000.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschweski, Armin, 4,102,553, Cl. 308-6.00C.

Brandes, Wilhelm: *See—*
Timmler, Helmut; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,102,891, Cl. 260-308.00R.

Brandt, Reinhard: *See—*
Pies, Wilfried; and Brandt, Reinhard, 4,102,205, Cl. 73-626.000.

Bratschi, Konrad, to K. Bratschi, Silent Gliss. Strip curtain. 4,102,381, Cl. 160-168.00R.

Braun, David L.: *See—*
Trine, John A.; and Braun, David L., 4,102,201, Cl. 73-421.50R.

Braun, Martin, to Raytheon Company. Rotating anode x-ray tube. 4,103,198, Cl. 313-60.000.

Brealt, Robert P.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Brecker, James N.: *See—*
Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., 4,103,226, Cl. 324-61.00R.

Brehmer, Edgar: *See—*
Schroder, Georg; and Brehmer, Edgar, 4,102,845, Cl. 260-29.7NR.

Breitinger, Hermann: *See—*
Collbrunn, Harald; Breitinger, Hermann; and Diekmann, Herbert, 4,102,281, Cl. 112-121.260.

Brennan, Michael E., to Texaco Development Corporation. Production of di-(N,N-disubstituted amino) alkanes. 4,103,087, Cl. 544-78.000.

Brenner, Douglas; and Oswald, Alexis A., to Exxon Research & Engineering Co. Quaternary phosphonium ionomers. 4,102,876, Cl. 526-19.000.

Brieaddy, Lawrence Edward: *See—*
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,103,020, Cl. 424-274.000.

Briles, Paul R.: *See—*
Salter, Larry, 4,102,036, Cl. 29-525.000.

Bristol-Myers Company: *See—*
Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, 4,102,885, Cl. 544-283.000.
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,103,085, Cl. 544-27.000.

British Steel Corporation: *See—*
Hawkes, David A.; Robson, Alan L.; and Uemlianin, Andray, 4,102,530, Cl. 266-46.000.

Broad, Bernard Henry, to English Clays Lovering Pochin & Company Limited. Plate filter presses. 4,102,788, Cl. 210-230.000.

Brobeck, William M., to Electric Power Research Institute, Inc. Multiring inertial energy storage wheel having tapered ring mounting members. 4,102,220, Cl. 74-572.000.

Brock, James Donald; and Mize, Erbie Gail, to Astec Industries, Inc. Method of reducing emission of particulate matter. 4,103,350, Cl. 366-22.000.

Brodoway, Nicolas, to Du Pont de Nemours, E. I., and Company. Process for making polyamine carbamates. 4,102,801, Cl. 252-182.000.

Brody, Philip S., to United States of America, Army. Ferroelectric photovoltaic method and apparatus for transferring information. 4,103,341, Cl. 365-117.000.

Brois, Stanley J.: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,102,798, Cl. 252-51.50A.

Broken Hill Proprietary Company, Limited, The: *See—*
Debenham, Michael, 4,102,304, Cl. 118-421.000.

Broker, Erich, to Paul Hammelmann Maschinenfabrik. Plunger pump. 4,102,611, Cl. 417-469.000.

Brookes, Frederick D.; and Franek, Jozef T., to Metal Box Limited. Rotary expansion tool. 4,102,168, Cl. 72-117.000.

Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, to International Business Machines Corporation. Polycarbonate ribbon for non-impact printing. 4,103,066, Cl. 428-337.000.

Brown, Alvin E., to Du Pont de Nemours, E. I., and Company. Method and system for measuring flow rate. 4,102,186, Cl. 73-194.00A.

Brown, Donald P.; and Cannon, Collins P., to United States of America, Energy. Neutron responsive self-powered radiation detector. 4,103,165, Cl. 250-390.000.

Brown, Lowell R.; and Field, Nathaniel L., to Ford Motor Company. Quality checking system for a threaded fastener assembly. 4,102,182, Cl. 73-136.00R.

Brown & Williamson Tobacco Corporation: *See—*
Psaras, John D.; and Sachleben, Leroy R., 4,102,349, Cl. 131-135.000.

Browne-Davies Electronic Corporation: *See—*
Redding, Robert J., 4,103,298, Cl. 340-331.000.

Bruckner Apparatebau GmbH: *See—*
Schuierer, Manfred, 4,102,157, Cl. 68-5.00D.

Brugger, Robert; Kohl, Martin; and Krause, Horst, to Langbein-Pfanhauser Werke AG. Method of and electrolytic bath for the electrodeposition of semibright nickel and nickel-cobalt coatings upon a metal surface. 4,102,755, Cl. 204-43.00T.

Brundage, Walter G. Pick harness. 4,102,234, Cl. 84-322.000.

Bryant, Patrick Doyle. Two-tone attention signal broadcasting system. 4,103,235, Cl. 325-64.000.

Buchel, Karl Heinz: *See—*
Timmler, Helmut; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,102,891, Cl. 260-308.00R.

Buchholz, Bernard, to Pennwalt Corporation. Manufacture of tertiary mercaptans using zeolite catalysts. 4,102,931, Cl. 260-609.00B.

Buchman, William W., to Hughes Aircraft Company. Spatial polarization coding electro-optical transmitter. 4,103,260, Cl. 332-7.510.

Buchser, William J.: *See—*
Beckett, Leo Gano; and Buchser, William J., 4,102,660, Cl. 62-344.000.

Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., to PPG Industries, Inc. Cationic electrodeposition using aqueous dispersions of quaternary ammonium carbonate-containing polymers. 4,102,863, Cl. 528-111.000.

Buckle, Brian Leonard. Buoyancy control apparatus for divers. 4,101,998, Cl. 9-316.000.

Budinger, Bruce O.; and Duke, June T., to Standard Oil Company, The. Rubber-modified acrylonitrile copolymers prepared in aqueous suspension. 4,102,947, Cl. 260-879.000.

Bundy, Gordon L., to Upjohn Company, The. ω-Aryl-2-decarboxy-2-hydroxymethyl-9-deoxy-9-methylene-PGF-type compounds. 4,103,097, Cl. 568-807.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-9-deoxy-9-methylene-PGF-type compounds. 4,103,098, Cl. 568-838.000.

Bunker Ramo Corporation: *See—*
Abler, Norman Christian, 4,102,023, Cl. 26-16.000.

Buntin, George A., to Hercules Incorporated. 1-Phenyl-hexyl ureas as herbicides. 4,102,673, Cl. 71-120.000.

Burchick, Duane A.: *See—*
Kimble, Joe W.; Burchick, Duane A.; and Dotson, Edsel E., 4,102,059, Cl. 35-25.000.

Burdick, Kenneth John, to GTE Sylvania Incorporated. PNP Current mirror. 4,103,249, Cl. 330-288.000.

Burgess, James F.; Girard, Roland T.; Martzloff, Francois D.; and Neugebauer, Constantine A., to General Electric Company. Reconstituted metal oxide varistor. 4,103,274, Cl. 338-21.000.

Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Catalyst demetallization by oxidation in a defined temperature range. 4,102,811, Cl. 252-411.00R.

Burnett & Rolfe Limited: *See—*
Chapman, Christopher P.; and Clarkson, Owen, 4,102,450, Cl. 198-774.000.

Burnham, Fred E.; and Clark, William H., to Litton Systems, Inc. Direction locating system. 4,103,304, Cl. 343-113.00R.

Burough, Irvin G.: *See—*
McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,103,174, Cl. 250-493.000.

Burr-Brown Research Corporation: *See—*
Olschewski, Wilfred W., 4,103,267, Cl. 336-65.000.

Burroughs Wellcome Co.: *See—*
Hodson, Harold Francis; and Batchelor, John Frederick, 4,103,015, Cl. 424-269.000.
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,103,020, Cl. 424-274.000.

Buschers, Herbert H.: *See—*
Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., 4,102,270, Cl. 102-49.500.

Buschman, Edward M., to Display Corporation International. Display device for holding paint chip cards. 4,102,072, Cl. 40-124.200.

Buschmann, Karl Robert: *See—*
Peddinghaus, Carl Ullrich; Hellkotter, Wolfgang; Einhaus, Albert; and Buschmann, Karl Robert, 4,102,228. Cl. 83-156.000.

Bustin, Leopold. Step mounting structure for vehicle tanks. 4,102,432, Cl. 182-92.000.

Butler Manufacturing Company: *See—*
Martin, James W.; and Hardwick, John R., 4,102,285, Cl. 113-54.00R.

Butler Ventamatic Corp.: *See—*
Anguish, Jerry Lee, 4,102,090, Cl. 52-58.000.

C.I. Hayes Inc.: *See—*
Martin, Frederick Raymond Patrick, 4,102,712, Cl. 362-71.000.

Cableries de Brugg S.A.: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Cady, John Joseph: *See—*
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.

Cage, Kenneth M.; and Turner, C. Warren, to Black Clawson Inc. Saw tooth insert. 4,102,232, Cl. 83-854.000.

Cahn, Robert P.; and Nicholson, Edward W., to Exxon Research & Engineering Co. Low vapor pressure organic heat retention materials kept at atmospheric pressure used as heat storage media. 4,102,741, Cl. 176-87.000.

Calamani, Sergio: *See—*
Gandini, Giuseppe; and Frignoli, Luigi, 4,102,794, Cl. 252-8.100.

Calderazzo, Franklin James, to Jayson, Richard N., a part interest. Torque reaction operated bicycle braking system and mounting structure. 4,102,439, Cl. 188-24.000.

California Institute of Technology: *See—*
Rembaum, Alan; and Yen, Shiao-Ping Siao, 4,102,827, Cl. 260-823.000.

Cama, Lovji D.: *See—*
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,102,882, Cl. 260-239.100.

Cambridge Scientific Instruments Limited: *See—*
Sturrock, John Monro; and Wallman, Bernard Allan, 4,103,168, Cl. 250-442.000.

Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, to Ciba-Geigy Corporation. Plaster compositions containing oxo-polycarboxylic acids as a set retarder. 4,102,701, Cl. 106-111.000.

Campbell, John A. L.; and Moynihan, Daniel J., to Peabody Coal Company. Mining method and apparatus. 4,102,550, Cl. 299-11.000.

Campbell, Robert W., to Phillips Petroleum Company. Aromatic sulfide/sulfone polymer production. 4,102,875, Cl. 528-388.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
East, Philip C., 4,103,164, Cl. 250-374.000.

Canfarge LTD (Francon Division): *See—*
Da Re, Cipriano, 4,102,957, Cl. 264-39.000.

Cannon, Collins P.: *See—*
Brown, Donald P.; and Cannon, Collins P., 4,103,165, Cl. 250-390.000.

Cannon, Robert Lee, III, to American Optical Corporation. Pacer demand-rate test mode control. 4,102,345, Cl. 128-419.0PT.

Canon Kabushiki Kaisha: *See—*
Masaki, Katsumi; Hirayama, Kazuhiro; and Sato, Yasushi, 4,103,156, Cl. 250-236.000.
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.
Matsumura, Isao; Kuwayama, Takeshi; and Kohayakawa, Yoshimi, 4,102,563, Cl. 351-7.000.
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, 4,103,307, Cl. 354-23.00D.

Carey, Patrick H., Jr., to Minnesota Mining and Manufacturing Company. Barrier tape construction. 4,102,721, Cl. 156-79.000.

Carlson, Lars A. Treatment of peripheral vascular disease by non-intraarterial administration of prostaglandin E_1. 4,103,026. Cl. 424-305.000.

Carlsson, Per Arvid Emil; Carnmalm, Bernt Sigfrid Emanuel; Ross, Svante Bertil; and Ulff, Carl Bengt Johan. Intermediates used in the preparation of phenyl-pyridylamine derivatives. 4,102,887, Cl. 260-290.0HL.

Carman, Edward W. Golf sand-trap smoothing implement. 4,102,405, Cl. 172-378.000.

Carnmalm, Bernt Sigfrid Emanuel: *See—*
Carlsson, Per Arvid Emil; Carnmalm, Bernt Sigfrid Emanuel; Ross, Svante Bertil; and Ulff, Carl Bengt Johan, 4,102,887, Cl. 260-290.0HL.

Caron, LaVerne A., to Chrysler Corporation. Electronic circuit for use in a variety of engine control systems. 4,102,310, Cl. 123-117.00R.

Caron, LaVerne Andrew: *See—*
Crall, Frederick William; Tomczak, Lawrence William; and Caron, LaVerne Andrew, 4,102,311, Cl. 123-117.00R.

Carr, Dennis James, to General Electric Company. Process to prepare polyhalodiphenyl carbonates. 4,102,912, Cl. 260-463.000.

Carr, John B., to Shell Oil Company. Method of lowering blood lipid levels in mammals. 4,103,021, Cl. 424-278.000.

Carr, John M., to Duncan Electric Company, Inc. Laser beam shutter and beam indicator. 4,103,261, Cl. 332-7.510.

Carr, Norman L.; and McGinnis, Edgar L., to Gulf Research & Development Company. Separation of solids from coal liquids using an additive. 4,102,774, Cl. 208-8.000.

Carrier Corporation: *See—*
Coleman, Milton H.; and Clark, William E., 4,102,494, Cl. 236-1.00B.
Greever, James E.; and Schafer, James P., 4,102,027, Cl. 29-157.3AH.
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,102,262, Cl. 100-53.000.
Matthews, Richard E.; and Bolton, Theodore S., 4,102,148, Cl. 62-77.000.

Carriers Securement Systems, Inc.: *See—*
Feary, Steven L.; and Boesel, Bradley W., 4,102,274, Cl. 105-367.000.

Carroll, Charles E.; and Hobbs, William H., to United States of America, Air Force. Emergency personnel lowering apparatus. 4,102,431, Cl. 182-5.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Nesting and stacking container. 4,102,453, Cl. 206-507.000.

Carroll, Richard Tobey: *See—*
Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, 4,102,935, Cl. 260-656.00R.

Carter, Gary W.: *See—*
Lord, David E.; Petrini, Richard R.; and Carter, Gary W., 4,102,582, Cl. 356-241.000.

Cartwright, Frederick D. Apparatus and method for use in one-sided welding. 4,103,142, Cl. 219-136.000.

Carvalho, Birttie L. Device for heating a breast prosthesis. 4,103,147, Cl. 219-524.000.

Case, William John Philip, to International Business Machines Corporation. Motion control system. 4,103,314, Cl. 360-78.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,103,334, Cl. 364-900.000.

Castellani, Eugene Evans; Powers, John Vincent; and Romankiw, Lubomyr Taras, to International Business Machines Corporation. Nickel-iron (80:20) alloy thin film electroplating method and electrochemical treatment and plating apparatus. 4,102,756, Cl. 204-43.00T.

Castleberry, Billy J. Tire pressure and mate check. 4,102,184, Cl. 73-146.200.

Caswell, Bruce F., to Arcanum Corporation. Agglomeration of finely divided sulfur particles in a liquid suspension. 4,102,968, Cl. 264-117.000.

Caterpillar Tractor Co.: *See—*
Maes, Richard J., 4,102,129, Cl. 60-403.000.
Marsden, Howard A.; and Haak, Willard J., 4,102,425, Cl. 180-66.00F.
Pinkham, Herbert G., 4,102,723, Cl. 156-120.000.
Schexnayder, Lawrence F., 4,102,250, Cl. 91-412.000.
Valbert, Gary Glen, 4,102,316, Cl. 123-198.0DB.

Cavitt, Stanley B., to Texaco Development Corp. Silver catalyst for ethylene epoxidation. 4,102,820, Cl. 252-463.000.

Cawley, William H.: *See—*
Rowe, Edward A., Jr.; and Cawley, William H., 4,102,710, Cl. 148-6.15R.

Celamerck GmbH & Co. KG.: *See—*
Ost, Walter; Thomas, Klaus; and Prokic-Immel, Ricarda, 4,102,910, Cl. 260-453.0RW.

Centre Technique du Bois: *See—*
Guillerm, Jean; and Fondronnier, Jacques, 4,102,371, Cl. 144-162.00R.

Cerheronics Inc.: *See—*
Kimble, Joe W.; Burchick, Duane A.; and Dotson, Edsel E., 4,102,059, Cl. 35-25.000.

Chabah, Maurice: *See—*
Gendreu, Robert; and Chabah, Maurice, 4,103,300, Cl. 343-6.00R.

Chaffee, Edwin George, to Litton Systems, Inc. Coupled cavity type traveling wave tube having improved pole piece structure. 4,103,207, Cl. 315-3.500.

Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Optically active esters and amides. 4,102,909, Cl. 260-404.000.

Chang, Christopher T.: *See—*
Hubbell, Wayne C.; and Chang, Christopher T., 4,103,339, Cl. 365-1.000.

Chang, Leroy Ligong; Esaki, Leo; and Sai-Halasz, George Anthony, to International Business Machines Corporation. Semiconductor memory devices. 4,103,312, Cl. 357-16.000.

Chapman, Christopher P.; and Clarkson, Owen, to Burnett & Rolfe Limited. Container washing and/or filling machines. 4,102,450, Cl. 198-774.000.

Charlton, Mark, to Hawker Siddeley Aviation Limited. Variable flow outlet valves. 4,102,357, Cl. 137-625.320.

Charm, Stanley E.; and Blair, Henry E. Radioassay kit for method of determining methotrexate. 4,102,455, Cl. 206-569.000.

Chatterley, Samuel: *See—*
Levitt, Charlie Maurice; Chatterley, Samuel; and Flinn, Peter John Livsey, 4,103,137, Cl. 219-69.00W.

Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, to Continental Group, Inc., The. Apparatus for removing excess coating

material accumulated at the interior edge portions of metal containers. 4,102,350, Cl. 134-130.000.

Chemische Werke Hucls Aktiengesellschaft: *See*—
Schroder, Georg; and Brehmer, Edgar, 4,102,845, Cl. 260-29.7NR.

Chen, Robert H. K.: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,102,895, Cl. 260-340.600.

Cherry, Charles C., to Hercules Incorporated. Ring lock actuation system. 4,102,498, Cl. 239-265.190.

Chevalier, Michel; Lucas, Jean-Claude; and Lacoste, Gerard, to Thomson-CSF. Phase-shifting system for electronically scanning antennas. 4,103,218, Cl. 323-1.000.

Chevron Research Company: *See*—
Lowe, Warren, 4,102,796, Cl. 252-47.500.
Mulaskey, Bernard F., 4,102,822, Cl. 252-465.000.
Wedel, Carroll J.; and Parker, Phillip H., 4,102,861, Cl. 260-45.95E.

Chew, William M.: *See*—
Martignoni, Pasquale; Murfree, James A., Jr.; Chew, William M.; and Ayers, Orval E., 4,102,988, Cl. 423-483.000.

Chikami, Leslie F. Tunable frequency laser. 4,103,254, Cl. 331-94.50S.

Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Meccaniques "Alsthom et Cie". Electrochemical oxygen production method. 4,102,757, Cl. 204-73.00R.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, 4,102,948, Cl. 260-944.000.
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.

Chisso Corporation: *See*—
Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.

Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, to Institut Francais du Petrole des Carburants et Lubrifiants. Device for emitting acoustic waves in a liquid medium. 4,103,280, Cl. 340-12.00R.

Chomes, Harry. Protective membrane flashing. 4,103,061, Cl. 428-247.000.

Chopra, Ram: *See*—
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.

Christe, Karl O.; and Schack, Carl J., to Rockwell International Corporation. Photolysis method for producing NF_4PF_6. 4,102,984, Cl. 423-301.000.

Christensen, Burton G.: *See*—
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,102,882, Cl. 260-239.100.

Christenson, James Gordon, to Hoffmann-La Roche Inc. Radioimmunoassay for benzoylecgonine. 4,102,979, Cl. 424-1.000.

Christenson, Roger M.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,102,863, Cl. 528-111.000.

Christiansson, Per Lennart, to Telub AB. Device for measuring loads, especially transient loads. 4,102,422, Cl. 177-210.00C.

Christoff, James W. Scarifying apparatus and method for railroad bed ballast removal. 4,102,066, Cl. 37-104.000.

Chromalloy American Corporation: *See*—
Adams, Richard R., 4,102,062, Cl. 36-72.00R.

Chromie, Edsel. Solar tracking system. 4,103,151, Cl. 250-203.00R.

Chrysler Corporation: *See*—
Caron, LaVerne A., 4,102,310, Cl. 123-117.00R.
Crall, Frederick William; Tomczak, Lawrence William; and Caron, LaVerne Andrew, 4,102,311, Cl. 123-117.00R.
Sarto, Jorma O., 4,102,314, Cl. 123-119.00B.

Chulay, Steven John, to Beckman Instruments, Inc. Data ring for vertical tube rotor. 4,102,490, Cl. 233-26.000.

Church, Peter K.; and Phillips, Alan G., to Kaman Sciences Corporation. Abrasive coated sharpening tool and method of making it. 4,102,085, Cl. 51-295.000.

Ciba-Geigy AG: *See*—
Garner, Robert; and Dunnenberger, Max, 4,102,893, Cl. 260-326.14R.
Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, 4,102,368, Cl. 141-250.000.

Ciba-Geigy Corporation: *See*—
Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, 4,102,701, Cl. 106-111.000.
Falk, Robert A., 4,102,916, Cl. 260-501.120.
Farooq, Saleem, 4,103,032, Cl. 424-341.000.
Fcery, Werner; and Fischer, Hans Peter, 4,102,668, Cl. 71-90.000.
Foery, Werner; and Fischer, Hans Peter, 4,102,670, Cl. 71-98.000.
Hofmann, Peter; Muller, Helmut; and Rody, Jean, 4,102,870, Cl. 528-73.000.
Loeffler, Herbert H., 4,102,476, Cl. 222-209.000.
Pusch, Gunter, 4,102,840, Cl. 260-29.40R.
Seitz, Karl, 4,102,880, Cl. 260-156.000.
Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, 4,102,639, Cl. 8-1.00A.
Zurbuchen, Jacques; and Dussy, Paul, 4,102,640, Cl. 8-73.000.

Cicatelli, Rodolfo, to Autovox S.p.A. Tape driving apparatus for tape play-back and/or recording devices. 4,102,517, Cl. 242-201.000.

Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., to Xerox Corporation. Self-diagnostic method and apparatus for disk drive. 4,103,338, Cl. 364-900.000.

Clack, Frederick Argles, Jr., to United Technologies Corporation. Hinged door quick release. 4,102,011, Cl. 16-149.000.

Clad Metals, Inc.: *See*—
Ulam, John B., 4,103,076, Cl. 428-653.000.

Clapp, Roger E., to Epp Corp. Non-impact printer with magnetic ink reorientation. 4,103,306, Cl. 346-153.000.

Clardy, Edwin K.: *See*—
Sanford, Richard A.; and Clardy, Edwin K., 4,103,177, Cl. 250-562.000.

Clark, George Winfred, III: *See*—
Mitscher, Lester Allen; Clark, George Winfred, III; and Bokelman, Gordon Herman, 4,103,091, Cl. 560-106.000.

Clark, Malcolm D. Positional sensor-operator system. 4,103,155, Cl. 250-231.0SE.

Clark, William E.: *See*—
Coleman, Milton H.; and Clark, William E., 4,102,494, Cl. 236-1.00B.

Clark, William H.: *See*—
Burnham, Fred E.; and Clark, William H., 4,103,304, Cl. 343-113.00R.

Clarke, John W.; and Miller, Galer J., to Eli Lilly and Company. Mixing vial. 4,102,451, Cl. 206-219.000.

Clarkson, Owen: *See*—
Chapman, Christopher P.; and Clarkson, Owen, 4,102,450, Cl. 198-774.000.

Claverie, Andre, to E.F.S.I. Establissements pour la Fabrication de Specialites Industrielles. Refractory compositions with ceramic and hydraulic setting. 4,102,695, Cl. 106-64.000.

Clay, Robert B.: *See*—
Cook, Merrill A.; and Clay, Robert B., 4,102,240, Cl. 86-20.00C.

Clayton, John Peter: *See*—
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,901, Cl. 260-345.80R.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,904, Cl. 260-345.70R.

Clement, Jean-Claude: *See*—
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.

Clopay Corporation: *See*—
Gossling, Robert C.; and Miller, Gerald W., 4,102,384, Cl. 160-263.000.
Miller, Gerald W., 4,102,383, Cl. 160-263.000.
Miller, Gerald W., 4,102,385, Cl. 160-263.000.

Clouse, Robert C.; and Asperger, Robert G., to Dow Chemical Company, The. Inhibitor for gas conditioning solutions. 4,102,804, Cl. 252-189.000.

Cluett, Peabody & Co., Inc.: *See*—
Rockerath, John L.; and Blum, John H., 4,102,283, Cl. 112-131.000.

Clunis, Kenneth, to Minnesota Mining and Manufacturing Company. Phonograph pickup device. 4,102,536, Cl. 274-23.00R.

Coale, Geneva N., executrix: *See*—
Coale, Harold D., deceased, 4,102,954, Cl. 264-24.000.

Coale, Harold D., deceased (by Coale, Geneva N., executrix), to Phillips Petroleum Company. Casting of PPS film. 4,102,954, Cl. 264-24.000.

Coates Brothers & Co., Ltd.: *See*—
Johnson, Norman Walter, 4,102,836, Cl. 260-22.0TN.

Cobe Laboratories, Inc.: *See*—
Jeffery, Russell L.; and Cote, Lawrence V., 4,102,655, Cl. 55-201.000.

Cody, David L., to Symons Corporation. Leg brace assembly for adjustable shoring apparatus. 4,102,096, Cl. 52-122.000.

Cody, David L., to Symons Corporation. Fastening means for a load-bearing structure. 4,102,108, Cl. 52-693.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing asymmetric induction. 4,102,925, Cl. 260-570.600.

Cohnen, Wolfgang: *See*—
Eimers, Erich; Dheim, Rolf; and Cohnen, Wolfgang, 4,102,859, Cl. 260-45.80A.

Cohrs, Gary D., to Flow Technology, Inc. Turbine flowmeter with overspeed protection. 4,102,189, Cl. 73-230.000.

Cole, Edward L.: *See*—
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,102,749, Cl. 201-2.500.

Cole, Lucille J.: *See*—
Putter, Irving; and Cole, Lucille J., 4,102,997, Cl. 424-115.000.

Cole-Parmer Instrument Company: *See*—
Nemcek, Donald Stephen, Sr., 4,103,231, Cl. 324-123.00R.

Coleman, Milton H.; and Clark, William E., to Carrier Corporation. Air distribution system. 4,102,494, Cl. 236-1.00B.

Colgate-Palmolive Company: *See*—
Bauman, Robert Andrew, 4,102,994, Cl. 424-54.000.
Finck, Patricia A., 4,102,799, Cl. 252-99.000.
Gaffar, Abdul, 4,102,993, Cl. 424-54.000.
Renaud, Jean, 4,102,826, Cl. 252-548.000.

Collbrunn, Harald; Breitinger, Hermann; and Diekmann, Herbert, to Durkoppwerke GmbH. Workpiece guide device for sewing machines. 4,102,281, Cl. 112-121.260.

Collins, William J. Device and method for suppressing active slag. 4,102,680, Cl. 75-257.000.

Colortronic Co., Ltd.: *See*—
Noguchi, Haruo; and Reinhard, Max, 4,103,357, Cl. 366-152.000.

Colortronic Reinhard & Co., KG: *See*—
Noguchi, Haruo; and Reinhard, Max, 4,103,357, Cl. 366-152.000.

Colpaert, James J., to Bendix Corporation, The. Drum brake. 4,102,442, Cl. 188-206.00A.
Colwell, Stephen Earl. Removable rifle sight. 4,102,053, Cl. 33-233.000.
Combustion Engineering, Inc.: *See—*
Mehta, Arun Kumar, 4,102,657, Cl. 55-222.000.
Commissariat a l'Energie Atomique: *See—*
Perdijon, Jean, 4,102,206, Cl. 73-644.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, 4,102,608, Cl. 417-242.000.
Communications Satellite Corporation: *See—*
Jacobus, Nelson Mortimer, Jr., 4,103,180, Cl. 307-141.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Dalmasso, Ginette, 4,103,328, Cl. 364-200.000.
Compressor Controls Corporation: *See—*
Rutshtein, Alexander; and Staroselsky, Naum, 4,102,604, Cl. 417-19.000.
Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., to Westinghouse Electric Corp. Variable capacity multiple compressor refrigeration system. 4,102,149, Cl. 62-196.00A.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Substituted phenyl naphthalenesulfonic acids. 4,102,917, Cl. 260-506.000.
Container Corporation of America: *See—*
Kipp, Michael A.; and Walter, Richard T., 4,102,484, Cl. 229-16.00A.
Continental Disc Corporation: *See—*
Shegrud, Donald M.; and Shaw, Kenneth R., 4,102,469, Cl. 220-89.00A.
Continental Group, Inc., The: *See—*
Boni, Kenneth A., 4,102,974, Cl. 264-294.000.
Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, 4,102,350, Cl. 134-130.000.
Control Devices, Inc.: *See—*
Flynn, M. Rutledge; and Schultz, Raymond P., 4,102,495, Cl. 236-46.00R.
Conway, Christopher J.; and Glover, Eugene G., to Mentor Corporation. Stimulator apparatus for internal body organ. 4,102,344, Cl. 128-419.00E.
Cook, David M.; and Gustafson, Douglas C., to Dow Chemical Company, The. Process for preparing sulfuryl-fluoride and -chlorofluoride products. 4,102,987, Cl. 423-466.000.
Cook, Edward J., to Safety Research & Engineering Corporation. Acoustical tire pressure valve. 4,103,282, Cl. 340-58.000.
Cook, Martin Christopher: *See—*
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.
Cook, Merrill A.; and Clay, Robert B. Blasting slurry pump truck. 4,102,240, Cl. 86-20.00C.
Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. High impact polyphenylene ether resin compositions containing mineral oil. 4,102,850, Cl. 260-33.6AQ.
Copping, John R.; and Foerstner, Richard A., to Amana Refrigeration, Inc. Method of making microwave oven seal structure. 4,102,041, Cl. 29-600.000.
Cordier, Andre Guy; and Stockholm, John George, to Air Industrie. Process and paint spray booth using a washing liquid and reuse thereof. 4,102,303, Cl. 118-326.000.
Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, to Ruhrchemie Aktiengesellschaft. Process for the continuous manufacture of α-cyano-ethylated aliphatic aldehydes. 4,102,913, Cl. 260-465.100.
Corning Glass Works: *See—*
Dumbaugh, William H., Jr., 4,102,664, Cl. 65-23.000.
Hawk, Robert M.; and Thiel, Frank L., 4,102,561, Cl. 350-96.210.
Mizzoni, Mary S.; and Reade, Richard F., 4,102,805, Cl. 252-301.40F.
Corona, Peter J., to Windsurfing International, Inc. Rotational molding apparatus. 4,102,624, Cl. 425-429.000.
Corrugated Products GmbH: *See—*
Mosse, Richard Wolfgang, 4,102,725, Cl. 156-200.000.
Costello, Michael. Burglarproof guard for window lock. 4,102,546, Cl. 292-346.000.
Cote, Lawrence V.: *See—*
Jeffery, Russell L.; and Cote, Lawrence V., 4,102,655, Cl. 55-201.000.
Coulter Electronics, Inc.: *See—*
Armstrong, Douglas, 4,102,810, Cl. 252-408.00R.
Courtaulds Limited: *See—*
Robinson, Frank; and Whatmough, Nigel Stephen, 4,102,155, Cl. 66-176.000.
Cousins, James R., to Hallmor, Inc. Door frame truing apparatus. 4,102,245, Cl. 90-12.00R.
Couston, Frederick Robert; and Bannock, Roy Robert, to Bell & Howell Limited. Pressure transducers. 4,102,210, Cl. 73-727.000.
Coutin, Pierre Fernand: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,102,520, Cl. 244-137.00R.
Covault, Darrell W. Heat exchange device for air conditioners. 4,102,152, Cl. 62-428.000.
Coyle, Maurice J. Hand-held compressor for use by radiologist. 4,103,176, Cl. 250-516.000.
Cragoe, Edward J., Jr.: *See—*
Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., 4,102,888, Cl. 260-294.80D.
Crain, N. Robert; Romance, Joseph S.; and Richert, Carson T., to Radiant Technology Corporation. Hazard prevention circuit for immersion heaters. 4,103,319, Cl. 361-106.000.
Crall, Frederick William; Tomczak, Lawrence William; and Caron, LaVerne Andrew, to Chrysler Corporation. Circuit for generating a sawtooth engine crank angle signal and an analog engine speed signal. 4,102,311, Cl. 123-117.00R.
Crandall, Walter E.: *See—*
Bahraman, Ali; and Crandall, Walter E., 4,103,111, Cl. 179-15.00A.
Cratty, Charles J., to Astro Development Corporation. Transporter and loading box for concrete mixer. 4,103,352, Cl. 366-39.000.
Crawley, Graham Charles: *See—*
Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, 4,103,023, Cl. 424-279.000.
Credelle, Thomas Lloyd, to RCA Corporation. Flat display device with beam guide. 4,103,204, Cl. 313-422.000.
Credelle, Thomas Lloyd, to RCA Corporation. Flat display device with beam guide. 4,103,205, Cl. 313-422.000.
Cremer, Gottfried. Method for the production of large-size densely sintered ceramic plates with a low wall thickness. 4,102,961, Cl. 264-57.000.
Cremona, Angelo. Device to fix the wood-stock with hooks of different length and for remote controlled extension or retraction of said hooks from or in the vertical or almost vertical supporting table of a veneer slicing machine. 4,102,372, Cl. 144-178.000.
Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, to Bristol-Myers Company. Process for preparing 2,4-dihaloquinazolines. 4,102,885, Cl. 544-283.000.
Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., to Dow Chemical Company, The. Method of controlling fluid loss from thixotropic cement. 4,102,400, Cl. 166-283.000.
Cripe, Gerald Edwin. Combined log skidder and loader. 4,102,528, Cl. 254-139.100.
Crisp, David, to Rizla Limited. Floating wick holder. 4,102,634, Cl. 431-298.000.
Crivello, James V., to General Electric Company. UV Curable composition of a thermosetting condensation resin and Group VIa onium salt. 4,102,687, Cl. 96-115.00R.
Crochemore, Michel; and Gay, Michel, to Rhone-Poulenc Industries. Stabilization of vinyl chloride polymers. 4,102,839, Cl. 260-23.0XA.
Crook, Edward J., Jr.; and Garrett, Charles R., to American Hoist & Derrick Company. Load indicating apparatus. 4,102,295, Cl. 116-114.00R.
Crooks, Walter: *See—*
Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, 4,103,066, Cl. 428-337.000.
Crosby, Edward L., Jr., to United States of America, Air Force. Variable lift inflatable airfoil for tethered balloons. 4,102,519, Cl. 244-125.000.
Crounse, Nathan N.: *See—*
Jefferies, Patrick J.; and Crounse, Nathan N., 4,103,092, Cl. 260-175.000.
Crutchfield, Marvin M.; and Upton, Charles J., to Monsanto Company. Tetrahydropyran and 1,4-dioxane polycarboxylate compounds, methods for making such compounds and compositions and methods employing same. 4,102,903, Cl. 260-345.70R.
Cruz, Herbert, to Raymond Lee Organization, Inc., The. Washing machine. 4,102,159, Cl. 68-132.000.
Csanady, Elmer R.: *See—*
Johnson, Craig E.; Dendor, Paul F.; and Csanady, Elmer R., 4,102,953, Cl. 264-3.00B.
Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, to Autoipari Kutato Intezet. Procedure for determining the starting point of fuel injection especially for running internal-combustion engines. 4,102,181, Cl. 73-119.00A.
Cseri, Zoltan, to United States Gypsum Company. Pipe anchor bracket. 4,102,524, Cl. 248-56.000.
Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., to American Optical Corporation. Material for fabrication of artificial intraocular lenses and hard contact lenses. 4,102,567, Cl. 351-160.000.
Cummings, Richard D., to Daystar Corporation. Temperature control in solar-to-thermal energy converters. 4,102,325, Cl. 126-270.000.
Cunningham, Andrew J.: *See—*
Tuffile, Fred M.; and Cunningham, Andrew J., 4,102,641, Cl. 8-10.100.
Cunningham, Wesley B. Drilling device. 4,102,415, Cl. 175-96.000.
Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Heat-resistant fiber conditioning agents. 4,102,793, Cl. 252-8.100.
Currie, Matthew Porter, to Currie, Matthew Porter; and Malarkey, John Victor, part interest to each. Frame member. 4,102,104, Cl. 52-494.000.
Currie, Richard Kenneth, to Blaser, Anton J. Optical encoder assembly and centering fixture. 4,102,028, Cl. 29-281.500.
Curtis & Marble Corporation: *See—*
Rose, Henry B., 4,102,112, Cl. 53-228.000.
Cusick, Richard D.; and Wall, Larry W., to Kansas Stall Company, Inc. Portable livestock stall. 4,102,307, Cl. 119-16.000.
Cutler-Hammer, Inc.: *See—*
Hults, Harold W.; and Halbeck, Werner B., 4,103,127, Cl. 200-67.00G.
Swinehart, Merle R., 4,103,299, Cl. 340-506.000.
Dahlstrand, Josef, Jr. Torque disconnect safety coupling. 4,102,154, Cl. 64-29.000.
Daicel Ltd.: *See—*
Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.

Daigle, Donald J.: *See*—
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,102,923, Cl. 260-553.00R.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Minami, Shinsaku; and Takase, Yoshiyuki, 4,103,011, Cl. 424-251.000.
Dallas, Charles M. Washer. 4,102,239, Cl. 85-50.00R.
Dalmasso, Ginette, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Control apparatus for controlling data flow between a control processing unit and peripheral devices. 4,103,328, Cl. 364-200.000.
Daly, Robert E.: *See*—
Gacki, Leonard W.; and Daly, Robert E., 4,103,358, Cl. 366-153.000.
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, to Motorola, Inc. Paging encoder system utilizing a telephone line link. 4,103,107, Cl. 179-2.0EC.
Dancy, Edna A., to Sidbec-Dosco Ltee. Self-healing thermocouple. 4,102,708, Cl. 136-233.000.
Danguillier, Wilhelm: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.
Danielmeyer, Hans-Gunter; and Hartmann, Werner, to Max Planck Gesellschaft zur Forderung der Wissenschaften e. V. Fluorescent screen. 4,103,173, Cl. 250-483.000.
Danszky, Istvan; and Szecska, Dezso, to Erdeszeti Tudomanyos Intezet. Reforestation tillage mechanism. 4,102,407, Cl. 172-611.000.
D'Arcy, James A. Automatic page turning apparatus. 4,102,071, Cl. 40-531.000.
Dardoufas, Kimon Constantine: *See*—
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,103,068, Cl. 428-395.000.
Da Re, Cipriano, to Canfarge LTD (Francon Division). Apparatus and method for manufacturing prestressed concrete railway ties. 4,102,957, Cl. 264-39.000.
Daskin, Robin: *See*—
Weinberger, Lester; and Daskin, Robin, 4,102,686, Cl. 96-91.00R.
Dataproducts Corporation: *See*—
Guarderas, Fernando V.; and Leon, Luis, 4,102,268, Cl. 101-399.000.
Datascope Corporation: *See*—
Grayzel, Joseph; and Terrell, William, 4,102,331, Cl. 128-2.10E.
Datta, Amitava: *See*—
Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, 4,102,713, Cl. 148-113.000.
d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, to Thomson-CSF. Electro-optical branching device and method of manufacturing the same. 4,103,154, Cl. 250-227.000.
David, Agoston: *See*—
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
David, Curt Ludwig: *See*—
Phillips, James Hugh; David, Curt Ludwig; and Rogers, Michael James, 4,103,222, Cl. 324-207.000.
Davies, John H.; Wood, Jack; and Pearson, Michael, to Shell Oil Company. Pesticidal 2-iminothiazoline derivatives. 4,103,017, Cl. 424-270.000.
Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, to International Business Machines Corporation. Data processing system with improved bit field handling. 4,103,329, Cl. 364-200.000.
Davis, Neil M.: *See*—
Wieder, Herman H.; and Davis, Neil M., 4,102,574, Cl. 356-117.000.
Davis, Ronald Percival, to Interlock Industries Limited. Sliding and swinging window stays. 4,102,012, Cl. 16-179.000.
Davis, Walter Bryan, to Beecham Group Limited. Dentifrice. 4,102,992, Cl. 424-49.000.
Davison, Sol: *See*—
Gergen, William P.; and Davison, Sol, 4,102,854, Cl. 260-42.180.
DAVY POWERGAS GmbH: *See*—
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 4,102,651, Cl. 23-277.00R.
Dawson, David: *See*—
Lloyd, William; Lloyd, Geoffrey John; and Dawson, David, 4,103,285, Cl. 340-65.000.
Day, William A.: *See*—
Archer, Robert A.; and Day, William A., 4,102,902, Cl. 260-345.300.
Dayal, Yogeshwar: *See*—
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.
Dayco Corporation: *See*—
Hopkins, Carl E., 4,102,360, Cl. 138-127.000.
Daystar Corporation: *See*—
Cummings, Richard D., 4,102,325, Cl. 126-270.000.
De La Moneda, Francisco H.; and Kotecha, Harish N., to International Business Machines Corporation. Two and three mask process for IGFET fabrication. 4,102,733, Cl. 156-653.000.
De La Moneda, Francisco H.: *See*—
DeBar, David E.; and De La Moneda, Francisco H., 4,102,714, Cl. 148-187.000.
de la Roche Kerandraon, Olivier Geoffroy, to Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.". Device for propelling ships. 4,102,293, Cl. 115-28.00R.
DeBar, David E.; and De La Moneda, Francisco H., to International Business Machines Corporation. Process for fabricating a low breakdown voltage device for polysilicon gate technology. 4,102,714, Cl. 148-187.000.
Debenham, Michael, to Broken Hill Proprietary Company, Limited, The. Apparatus for application of sealant. 4,102,304, Cl. 118-421.000.
Deborde, Albert Henri, to Saurer Diederichs (Societe Anonyme). Needles for shuttle-less looms. 4,102,363, Cl. 139-449.000.
Deem, Mary Lease, to Union Carbide Corporation. Aldol reactions catalyzed by alkylene oxide-salt complexes. 4,102,930, Cl. 260-593.00R.
Deere & Company: *See*—
Fox, Robert Eugene; and Reece, Wendell Dale, 4,102,540, Cl. 280-5.00H.
Stover, David Emmert; and Menzel, Alvin Lewis, 4,102,153, Cl. 64-28.00R.
Deetz, David R., to Xerox Corporation. Hammer driver controller for impact printers. 4,102,265, Cl. 101-93.030.
Deex, Oliver D.; and Weiss, Virgil W., to Monsanto Company. Polyesters of 1,2-bis(hydroxyphenyl) ethanes and aromatic dicarboxylic acids. 4,102,864, Cl. 528-173.000.
De Gelder, Jacob; Hill, William Harvey; and Englhard, Ronald F., to Leisure Group, The. Deflector assembly for a spray gun. 4,102,501, Cl. 239-511.000.
Deggendorfer Werft und Eisenbau GmbH: *See*—
Vogl, Rudolf, 4,102.652, Cl. 23-288.00M.
DeLaTorre, Pearline; and Beers, Melvin D., to General Electric Company. Self-extinguishing room temperature vulcanizable silicone rubber compositions. 4,102,852, Cl. 260-37.0SB.
Delaunois, Yvon: *See*—
Peerts, Fernand; and Delaunois, Yvon, 4,102,874, Cl. 528-387.000.
Deliere, Jean: *See*—
Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.
Dellorfano, Fred M., Jr.: *See*—
Massa, Frank, 4,103,309, Cl. 354-25.000.
Del Sarto, Franco, to Inox Industria E. Comercio de Aco S/A. Pulp refining disk. 4,102,505, Cl. 241-297.000.
DeMasi, Ralph G. Stripper bar for rolling pin. 4,102,026, Cl. 29-110.500.
Demchenko, Taras Filippovich: *See*—
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.
Deming, Andrew F.; and Russell, James B., to Alliance Manufacturing Company, The. Transmitter modulated with three modulation patterns. 4,103,238, Cl. 325-141.000.
Dendor, Paul F.: *See*—
Johnson, Craig E.; Dendor, Paul F.; and Csanady, Elmer R., 4,102,953, Cl. 264-3.00B.
Denes, George, to RCA Corporation. Memory cells. 4,103,185, Cl. 307-238.000.
Deneyer, Jose N. E.: *See*—
Timmermans, Armand; Selleslagh, Eduard; and Deneyer, Jose N. E., 4,103,233, Cl. 324-208.000.
DeNigris, Ernest Gerard; and Olsen, Merle Victor, to Bell Telephone Laboratories, Incorporated. Snap action switch. 4,103,126, Cl. 200-67.00C.
Denisov, Jury Nikolaevich: *See*—
Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich, 4,102,016, Cl. 19-159.00R.
Dentsply Research & Development Corp.: *See*—
Walker, Barvo N., 4,102,047, Cl. 32-71.000.
de Putter, Warner Jan, to Wavin B. V. Thermally insulated pipe with electrically conducting portions for dissipating static electricity. 4,103,320, Cl. 361-215.000.
Dera, Alain; and Goupy, Marcel, to Regie Nationale des Usines Renault. Enveloping helmet of composite structure. 4,101,983, Cl. 2-412.000.
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, to W. Schlafhorst & Co. Method and apparatus for controlling a thread-joining operation in rotor spinning machines. 4,102,116, Cl. 57-34.00R.
Dervissoglou, Angelo: *See*—
Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.
DeSavigny, Chester Blair: *See*—
Popoff, Ivan Christoff; and DeSavigny, Chester Blair, 4,102,800, Cl. 252-182.000.
De Schepper, Achille: *See*—
Hiemeleers, Jozef; De Schepper, Achille; and Van Peteghem, Antoine, 4,102,976, Cl. 423-87.000.
Deserno, Peter; and Prost, Hans, to Siemens Aktiengesellschaft. Electronic jamming system. 4,103,236, Cl. 325-132.000.
Design & Manufacturing Corporation: *See*—
Smith, Lynn C., 4,102,213, Cl. 74-110.000.
Desnos, Monique: *See*—
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 4,102,890, Cl. 260-307.00F.
Deubzer, Bernward; and Graf, Werner, to Wacker-Chemie GmbH. Thermosetting compositions which can be cured to form molded objects or coatings. 4,102,970, Cl. 264-176.00R.

Deuterium Corporation: *See*—
Spevack, Jerome S., 4,102,650, Cl. 23-270.50W.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Diehl, Walter; and Koehler, Wolfgang, 4,103,275, Cl. 338-25.000.
Devarakonda, Vasant K.; and Kovar, John L., to United States of America, Army. Slide fastener endurance tester. 4,102,180, Cl. 73-91.000.
Developmental Sciences, Inc.: *See*—
Krachman, Howard Ellis, 4,102,558, Cl. 339-144.00R.
Deverell, Harry E., to Allegheny Ludlum Industries, Inc. Austenitic stainless steel. 4,102,677, Cl. 75-128.00A.
deVersterre, William I.: *See*—
Petry, Henry Alfred; and deVersterre, William I., 4,102,171, Cl. 72-245.000.
DeVito, Louis; and Esser, Albert H., to Instrumentation Engineering, Inc. Variable function digital word generating, receiving and monitoring device. 4,102,491, Cl. 235-302.000.
Dheim, Rolf: *See*—
Eimers, Erich; Dheim, Rolf; and Cohnen, Wolfgang, 4,102,859, Cl. 260-45.80A.
Diaclear, Inc.: *See*—
Portyrata, Raymond E., 4,102,790, Cl. 210-293.000.
Diamond Shamrock Corporation: *See*—
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,103,016, Cl. 424-270.000.
Rowe, Edward A., Jr.; and Cawley, William H., 4,102,710, Cl. 148-6.15R.
Dickey-john Corporation: *See*—
Eng, William T., 4,102,194, Cl. 73-340.000.
Didde-Glaser, Inc.: *See*—
Sommers, Richard L.; and Sickler, Fred H., 4,102,264, Cl. 101-77.000.
Diehl, Walter; and Koehler, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Resistance element for resistance thermometer and process for its manufacturing. 4,103,275, Cl. 338-25.000.
Diekmann, Herbert: *See*—
Collbrunn, Harald; Breitinger, Hermann; and Diekmann, Herbert, 4,102,281, Cl. 112-121.260.
Dieterich, Dieter: *See*—
Scholl, Hans-Joachim; Markusch, Peter; and Dieterich, Dieter, 4,102,699, Cl. 106-84.000.
Dietrich, David S., to Sofec, Inc. Method of and apparatus for handling hose underwater. 4,102,146, Cl. 61-110.000.
Dietz, David R.: *See*—
Phillips, William A.; and Dietz, David R., 4,102,636, Cl. 432-30.000.
Dietze, Wolfgang; and Stut, Hans, to Siemens Aktiengesellschaft. Device for deposition of semi-conductor material. 4,102,298, Cl. 118-5.000.
Dildy, Clell A., Jr.; and Adair, Lyles C., to United States of America, Navy. Diver navigation system. 4,103,279, Cl. 340-3.00D.
Dimmick, James Owen, to Bell Telephone Laboratories, Incorporated. Interrupt control circuit. 4,103,327, Cl. 364-200.000.
Dingwall, Andrew Gordon Francis: *See*—
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, 4,103,183, Cl. 307-214.000.
Dios, Inc.: *See*—
McAlear, James H.; and Wehrung, John M., 4,103,064, Cl. 428-333.000.
McAlear, James H.; and Wehrung, John M., 4,103,073, Cl. 428-474.000.
DiPiazza, James John, to RCA Corporation. Nonreflecting photoresist process. 4,102,683, Cl. 96-38.400.
Di Pietro, Charles: *See*—
Lore, Nicola; and Di Pietro, Charles, 4,102,471, Cl. 220-242.000.
Display Corporation International: *See*—
Buschman, Edward M., 4,102,072, Cl. 40-124.200.
Djordjevic, Mihailo: *See*—
Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, 4,102,350, Cl. 134-130.000.
DLM, Inc.: *See*—
Eckert, Ronald P., 4,102,069, Cl. 40-497.000.
Dobo, Gyorgy: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.
Dodds, Robert E.: *See*—
Schulze, Harry O.; Dodds, Robert E.; and Herner, Raymond F., 4,103,069, Cl. 428-403.000.
Doerer, Richard P., to Van Dresser Corporation. Method of treating and forming a panel. 4,102,975, Cl. 264-322.000.
Doerre, Reinhard, to E. Breuninger KG., Firma. Apparatus for signaling an unauthorized removal of a garment from a premises. 4,103,295, Cl. 340-572.000.
Dollinger, Gustav: *See*—
Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, 4,102,793, Cl. 252-8.100.
Dolphin Brake Corp., The: *See*—
Rancourt, Yvon, 4,102,438, Cl. 188-18.00A.
Dominion Auto Accessories Limited: *See*—
Urbanek, Karel, 4,103,323, Cl. 362-306.000.
Donahue, Paul E.: *See*—
Williams, Frank J., III; and Donahue, Paul E., 4,102,905, Cl. 260-346.300.
Doner, John T., to Whirlpool Corporation. Oven door construction. 4,102,322, Cl. 126-198.000.
Dornberger, Georg Christian Ernst, to Western Electric Company, Inc. Wire twisting method and apparatus. 4,102,117, Cl. 57-93.000.
Dorr-Oliver Incorporated: *See*—
Wall, Clarence J., 4,102,277, Cl. 110-342.000.
Dotson, Edsel E.: *See*—
Kimble, Joe W.; Burchick, Duane A.; and Dotson, Edsel E., 4,102,059, Cl. 35-25.000.
Dougherty, Timothy Stephen, to Western Electric Company, Inc. Apparatus for working expandable thermoplastic materials. 4,103,353, Cl. 366-81.000.
Dow Chemical Company, The: *See*—
Clouse, Robert C.; and Asperger, Robert G., 4,102,804, Cl. 252-189.000.
Cook, David M.; and Gustafson, Douglas C., 4,102,987, Cl. 423-466.000.
Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., 4,102,400, Cl. 166-283.000.
Quarderer, George J.; and Moll, Norman G., 4,102,775, Cl. 208-10.000.
Wagner, Eugene R.; and Allen, Bobbie J., 4,103,027, Cl. 424-309.000.
Wagner, Eugene R.; and Allen, Bobbie J., 4,103,029, Cl. 424-318.000.
Dowling, Donald J.; and Arnold, Dan M., to Texaco Inc. Acoustic-nuclear permeability logging system. 4,102,185, Cl. 73-155.000.
Downing, Keith Stanley; and Johnston, Richard, to Gillette Company, The. Cutting edges coated with polyfluorocarbon polymer. 4,102,046, Cl. 30-346.530.
Doyel, John S. Battery operated device for cleaning phonograph records and the like. 4,101,999, Cl. 15-1.50R.
Dransfield, Clifford D., to Atlantic Richfield Company. Apparatus for generating seismic waves. 4,102,429, Cl. 181-117.000.
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., to Xerox Corporation. Transfer and fusing method. 4,102,681, Cl. 96-1.400.
Dravo Corporation: *See*—
Jaquay, Louis H., 4,102,676, Cl. 75-77.000.
Draxler, Walter E., to Arrow Pneumatic, Inc. Quick coupling/locking device. 4,102,473, Cl. 220-319.000.
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, to Bergwerksverband GmbH. Method for closing off a mine gallery especially for use to prevent spreading of underground explosions. 4,102,138, Cl. 61-42.000.
Drescher, Norbert: *See*—
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.
Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., to American Hospital Supply Corporation. Amylase determination. 4,102,747, Cl. 195-103.50C.
Driver, W. B. Core cut off cable. 4,102,417, Cl. 175-253.000.
Droll Yankees, Inc.: *See*—
Kilham, Peter, 4,102,308, Cl. 119-52.00R.
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, to Societe Nationale Industrielle Aerospatiale. Apparatus for analyzing electrical signals of variable amplitude. 4,103,230, Cl. 324-77.00H.
Duconge, Claude: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,103,280, Cl. 340-12.00R.
Dudderar, Thomas Dixon; and Simpkins, Peter Gerald, to Bell Telephone Laboratories, Incorporated. Caustic ray use of the drawdown zone of an optical fiber preform to control the drawing of the fiber. 4,102,661, Cl. 65-2.000.
Dudek, Thomas J.: *See*—
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,102,971, Cl. 264-255.000.
Duke, June T.: *See*—
Budinger, Bruce O.; and Duke, June T., 4,102,947, Cl. 260-879.000.
Dumbaugh, William H., Jr., to Corning Glass Works. Method for making glass articles with defect-free surfaces. 4,102,664, Cl. 65-23.000.
Duncan, Alexander W.: *See*—
Andrade, Ralph W.; and Duncan, Alexander W., 4,102,043, Cl. 29-739.000.
Duncan Electric Company, Inc.: *See*—
Carr, John M., 4,103,261, Cl. 332-7.510.
Dunn, Michael: *See*—
Koch, Louis; Dunn, Michael; and Lumpkin, Charles, 4,102,848, Cl. 260-31.600.
Dunnenberger, Max: *See*—
Garner, Robert; and Dunnenberger, Max, 4,102,893, Cl. 260-326.14R.
Duperray, Gilbert; Monnet, Andre; and Tournut, Claude, to Produits Chimiques Ugine Kuhlmann. Method of molding polytetrafluoroethylene. 4,102,966, Cl. 264-112.000.
Du Pont de Nemours, E. I., and Company: *See*—
Brodoway, Nicolas, 4,102,801, Cl. 252-182.000.
Brown, Alvin E., 4,102,186, Cl. 73-194.00A.
Dupre, Eugene J.: *See*—
Baratto, Eugene L.; and Dupre, Eugene J., 4,103,056, Cl. 428-142.000.

Duraiswamy, Kandaswamy: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; and Lumpkin, Robert E., 4,102,773, Cl. 208-8.000.
Durkoppwerke GmbH: *See*—
Collbrunn, Harald; Breitinger, Hermann; and Diekmann, Herbert, 4,102,281, Cl. 112-121.260.
Hannemann, Franz, 4,102,280, Cl. 112-121.260.
Dussy, Paul: *See*—
Zurbuchen, Jacques; and Dussy, Paul, 4,102,640, Cl. 8-73.000.
Duwe, Edward C.; and Duwe, William E. Crypt closure panel and method for sealing a crypt opening. 4,102,098, Cl. 52-140.000.
Duwe, William E.: *See*—
Duwe, Edward C.; and Duwe, William E., 4,102,098, Cl. 52-140.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Weissenfels, Franz; and Junger, Hans, 4,102,832, Cl. 521-103.000.
Dynatel Corporation: *See*—
Stephens, Berton H., 4,103,225, Cl. 324-60.0CD.
Dynic Corporation: *See*—
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
Dziura, Walter Henry, to Scovill Manufacturing Company. Key holder. 4,102,165, Cl. 70-456.00B.
Dzurik, John A., to American Cyanamid Company. Use of chitosan in corrugating medium. 4,102,738, Cl. 162-117.000.
D'Zuro, Deborah Sue Anne: *See*—
Groves, James D.; and D'Zuro, Deborah Sue Anne, 4,102,716, Cl. 156-48.000.
E. Breuninger KG., Firma: *See*—
Doerre, Reinhard, 4,103,295, Cl. 340-572.000.
E.F.S.I. Etablissements pour la Fabrication de Specialites Industrielles: *See*—
Claverie, Andre, 4,102,695, Cl. 106-64.000.
E. R. Squibb & Sons, Inc.: *See*—
Hauck, Frederic P.; and Fox, Rita T., 4,103,094, Cl. 560-231.000.
Hauck, Frederic P.; and Reid, Joyce, 4,103,095, Cl. 560-252.000.
Eagan, Robert L. Method of assembling collector electrode panels in electrostatic precipitators. 4,102,038, Cl. 29-592.00R.
East, Philip C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Radiacmeter with null deflection system. 4,103,164, Cl. 250-374.000.
Ebbeson, Bengt Ebbe Oscar; and Wisjo, Bjorn Alvar. Device for setting and furling sails. 4,102,289, Cl. 114-104.000.
Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Hydrotreating catalyst and process utilizing the same. 4,102,818, Cl. 252-439.000.
Ecke, George G., to PPG Industries, Inc. Control of plant pests with bis(4-chlorophenyl)methyl methyl sulfoxide. 4,103,031, Cl. 424-337.000.
Eckert, Ronald P., to DLM, Inc. Revolving self-service display stand. 4,102,069, Cl. 40-497 000.
Edman, Hans Per Reinhold, to Sundstrand Corporation. Burner control system. 4,102,630, Cl. 431-29.000.
Eguchi, Hiroshi: *See*—
Kawamura, Yoshikazu; and Eguchi, Hiroshi, 4,103,191, Cl. 310-49.00R.
Eigenmann, Ludwig. Method and devices for applying tape marking material on road surfaces. 4,102,718, Cl. 156-71.000.
Eimers, Erich; Dheim, Rolf; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. Stabilizer mixtures. 4,102,859, Cl. 260-45.80A.
Einhaus, Albert: *See*—
Peddinghaus, Carl Ullrich; Hellkotter, Wolfgang; Einhaus, Albert; and Buschmann, Karl Robert, 4,102,228, Cl. 83-156.000.
Eisenberg, Adi; and Ovshinsky, Stanford R., to Energy Conversion Systems, Inc. Method for storage of retrievable information dispersion imaging material and method. 4,103,044, Cl. 427-56.000.
Electric Power Research Institute, Inc.: *See*—
Brobeck, William M., 4,102,220, Cl. 74-572.000.
Foster, Carlton G., 4,102,175, Cl. 73-4.00R.
Electricite de France (Service National): *See*—
Blum, Jacques Marcel; and Ventre, Edmond, 4,102,740, Cl. 176-84.000.
Electrooxidation Systems, Inc.: *See*—
Hedges, Richard A.; and Pearl, Maurice H., 4,102,754, Cl. 204-275.000.
Elgin-Macor, Inc.: *See*—
Jay, Melvin C., 4,102,545, Cl. 292-57.000.
Eli Lilly and Company: *See*—
Archer, Robert A.; and Day, William A., 4,102,902, Cl. 260-345.300.
Clarke, John W.; and Miller, Galer J., 4,102,451, Cl. 206-219.000.
Taylor, Harold Mellon, 4,102,669, Cl. 71-94.000.
Eliche, Jean Marc: *See*—
Augier, Robert Joseph Ernest; and Eliche, Jean Marc, 4,102,618, Cl. 425-64.000.
Ellner, Sidney. Ultraviolet liquid purification system. 4,103,167, Cl. 250-432.00R.
Elms, Robert T., to Westinghouse Electric Corp. Add-on instant restrike device for an HID lamp. 4,103,209, Cl. 315-207.000.
Eltra Corporation: *See*—
Badger, John P.; and Rinker, Jack R., 4,102,024, Cl. 29-6.200.
Emblem, Harold Garton: *See*—
Walters, Ian Richard; and Emblem, Harold Garton, 4,102,691, Cl. 106-38.350.
Emerson Electric Co.: *See*—
Landgraf, Robert A., 4,103,213, Cl. 318-224.00A.
Spradling, Gene V., 4,103,212, Cl. 318-224.00A.
EMI Limited: *See*—
Hounsfield, Godfrey Newbold, 4,103,169, Cl. 250-445.00T.
Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, to Kawasaki Steel Corporation. Method of producing layer-like clad metal materials. 4,102,033, Cl. 29-527.300.
Endras, Gerhard: *See*—
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,102,138, Cl. 61-42.000.
Energy Conversion Systems, Inc.: *See*—
Eisenberg, Adi; and Ovshinsky, Stanford R., 4,103,044, Cl. 427-56.000.
Energy 76, Inc.: *See*—
Botts, Elton M., 4,102,394, Cl. 166-65.00R.
Eng, William T., to Dickey-john Corporation. Electronic bin temperature monitor. 4,102,194, Cl. 73-340.000.
Engeler, William E.; and Goldberg, Howard S., to General Electric Company. Charge transfer apparatus. 4,103,343, Cl. 365-183.000.
Engineering Inventions Inc.: *See*—
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,102,256, Cl. 99-372.000.
Englhard, Ronald F.: *See*—
De Gelder, Jacob; Hill, William Harvey; and Englhard, Ronald F., 4,102,501, Cl. 239-511.000.
English Clays Lovering Pochin & Company Limited: *See*—
Broad, Bernard Henry, 4,102,788, Cl. 210-230.000.
English, David C.: *See*—
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., 4,102,031, Cl. 29-464.000.
Enomoto, Kazuyoshi: *See*—
Ozaki, Tsutomu; and Enomoto, Kazuyoshi, 4,102,421, Cl. 177-185.000.
Ensign-Bickford Company: *See*—
Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., 4,102,428, Cl. 181-116.000.
Enssle, Gerhard: *See*—
Keller, Gustav; and Enssle, Gerhard, 4,102,088, Cl. 52-20.000.
Epp Corp.: *See*—
Clapp, Roger E., 4,103,306, Cl. 346-153.000.
Equipto Electronics Corporation: *See*—
Reimer, Richard C., 4,102,554, Cl. 312-107.000.
Erbstoesser, Steven R., to Exxon Production Research Company. Well treatment fluid diversion with low density ball sealers. 4,102,401, Cl. 166-284.000.
Erdeszeti Tudomanyos Intezet: *See*—
Danszky, Istvan; and Szecska, Dezso, 4,102,407, Cl. 172-611.000.
Erich, Frank: *See*—
Pfeiffer, Hans Jorg; Rene, Keller; and Erich, Frank, 4,102,705, Cl. 127-37.000.
Erickson, Edwin: *See*—
Vaplon, Gary Gene; Erickson, Edwin; and Young, Joseph L., 4,102,502, Cl. 241-4.000.
Erickson, Gerald L., to United States of America, Energy. Dynamic pulse difference circuit. 4,103,148, Cl. 235-92.0PC.
Erickson, John W.: *See*—
Erickson, John Walter; and Erickson, John W., 4,103,133, Cl. 200-153.00N.
Erickson, John Walter; and Erickson, John W., to Boltswitch, Inc. Dual switch operator using modified Geneva movement. 4,103,133, Cl. 200-153.00N.
Ernst, Horst M.; Brandenstein, Manfred; and Olschweski, Armin, to SKF Kugellagerfabriken GmbH. Roller bearing for longitudinally movable machine elements. 4,102,553, Cl. 308-6.00C.
Ernst, John Alan: *See*—
Robinson, Robert Earl; and Ernst, John Alan, 4,102,667, Cl. 71-3.000.
Esaki, Leo: *See*—
Chang, Leroy Ligong; Esaki, Leo; and Sai-Halasz, George Anthony, 4,103,312, Cl. 357-16.000.
Escher Wyss Limited: *See*—
Lehmann, Rolf, 4,102,025, Cl. 29-116.0AD.
Espaignol, Jacques; and Klein, Edmond, to Thomson-CSF. Method of creating a millimeter wave source and of adapting such a source to waveguide transmission. 4,102,037, Cl. 29-583.000.
Esser, Albert H.: *See*—
DeVito, Louis; and Esser, Albert H., 4,102,491, Cl. 235-302.000.
Essex Group, Inc.: *See*—
Grable, Jack W.; and Willeke, Steven A., 4,103,269, Cl. 337-67.000.
Estes, Larry A.; and Williams, Gerald D., to Toro Company, The. Combination level adjust and self-tensioning belt assembly for mowers. 4,102,114, Cl. 56-15.200.
Etablissement d'Etudes et de Recherches Architecturales E.R.A.: *See*—
Perreten, Roger, 4,102,100, Cl. 52-227.000.
Eto, Goro; and Hikida, Chuichi, to Futaba Denshi Kogyo K. K. Flat type multi-digit indicating apparatus. 4,103,206, Cl. 313-513.000.
Eurom, Fred. Double cable reel. 4,102,445, Cl. 191-12.20R.
Evans, Adlard & Company Limited: *See*—
Harris, Frank John Turner, 4,102,792, Cl. 210-457.000.
Evans, David M.; and Ramos, Joel A., to S & C Electric Company. High voltage circuit interrupter switch arrangement. 4,103,129, Cl. 200-144.00R.
Evans, Norol T., to Hughes Aircraft Company. Constant false alarm rate moving target indication radar system (CFAR-MTI). 4,103,301, Cl. 343-7.700.

Ex-Cell-O Corporation: *See*—
Voglrieder, Leonhard; and Hempel, Raymond O., Jr., 4,102,035, Cl. 29-568.000.
Exhibition Showplace Services Limited: *See*—
Jarvis, Barry Michael Frank, 4,102,087, Cl. 52-9.000.
Exxon Production Research Company: *See*—
Erbstoesser, Steven R., 4,102,401, Cl. 166-284.000.
Exxon Research & Engineering Co.: *See*—
Bloch, Heinz P., 4,102,052, Cl. 33-180.00R.
Brenner, Douglas; and Oswald, Alexis A., 4,102,876, Cl. 526-19.000.
Cahn, Robert P.; and Nicholson, Edward W., 4,102,741, Cl. 176-87.000.
Eberly, Paul E., Jr., 4,102,818, Cl. 252-439.000.
McCoy, Carleton J.; and Schwartz, Robert D., 4,102,744, Cl. 195-28.00R.
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,102,798, Cl. 252-51.50A.
Thaler, Warren A., 4,103,079, Cl. 526-185.000.
Wheelock, Kenneth S., 4,102,777, Cl. 208-121.000.
Fa. C. Stiefelmauer K.G.: *See*—
Reiff, Karl; and Masur, Klaus, 4,102,051, Cl. 33-174.00P.
Facetglas, Inc.: *See*—
Ridgeway, Louis H., 4,102,964, Cl. 264-92.000.
Fagan, John L., to Westinghouse Electric Corp. Volatile and nonvolatile random access memory cell. 4,103,348, Cl. 365-228.000.
Fagan, John Lee; White, Marvin Hart; and Lampe, Donald Ross, to Westinghouse Electric Corp. Method and apparatus for addressing a non-volatile memory array. 4,103,344, Cl. 365-184.000.
Fahim, Magdi M.; and Marscher, William D., to Bendix Corporation, The. Proportional controller for controlling air flow to an engine. 4,102,315, Cl. 123-124.00B.
Falk, Robert A., to Ciba-Geigy Corporation. Perfluoroalkylthioaminimide derivatives. 4,102,916, Cl. 260-501.120.
Fanberg, Victor Vincent. Depth key set. 4,102,247, Cl. 90-62.00R.
Fannin, Bill B.: *See*—
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.
Farese, Frank: *See*—
Gold, Joseph; and Farese, Frank, 4,102,492, Cl. 235-375.000.
Farge, Herve, to Societe Anonyme dite: S I C O F. Prefabricated buildings. 4,102,091, Cl. 52-79.700.
Farmer, Larry B., to Milliken Research Corporation. Pilling reduction in textiles. 4,103,051, Cl. 427-394.000.
Farooq, Saleem, to Ciba-Geigy Corporation. Method of combatting fungi and *Pseudomonas solanacerum*. 4,103,032, Cl. 424-341.000.
Farrant, John Lascelles: *See*—
Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, 4,102,608, Cl. 417-242.000.
Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Electromagnetic sensor and memory device. 4,103,340, Cl. 365-97.000.
Feary, Steven L.; and Boesel, Bradley W., to Carriers Securement Systems, Inc. Cylindrical cargo securement apparatus and method therefore. 4,102,274, Cl. 105-367.000.
Feichtinger, Hans: *See*—
Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, 4,102,913, Cl. 260-465.100.
Feinberg, Emanuel, to Paragon Resources, Inc. Exhaust stack damper control. 4,102,629, Cl. 431-20.000.
Felix, Harold E. Marine safety signal device. 4,102,296, Cl. 116-124.00B.
Feltgen, Karlheinz: *See*—
Kubitzek, Harry; Feltgen, Karlheinz; and Rosendahl, Friedrich-Karl, 4,102,965, Cl. 264-103.000.
Ferris, Hamilton Y. Catamaran with swingable mast and hulls. 4,102,287, Cl. 114-39.000.
Ferriss, Lincoln Stark, to Singer Company, The. Electrostatic accelerometer. 4,102,202, Cl. 73-517.00B.
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. ω-Aminocarboxylic acid amide phosphates. 4,102,948, Cl. 260-944.000.
Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, to Westinghouse Electric Corp. Arc heater production of silicon involving alkali or alkaline-earth metals. 4,102,765, Cl. 204-164.000.
Fey, Maurice G., to Westinghouse Electric Corp. Process for doping high purity silicon in an arc heater. 4,102,766, Cl. 204-164.000.
Fey, Maurice G.: *See*—
Harvey, Francis J., II; and Fey, Maurice G., 4,102,764, Cl. 204-164.000.
Mazelsky, Robert; Fey, Maurice G.; and Harvey, Francis J., 4,102,767, Cl. 204-164.000.
Field, Nathaniel L.: *See*—
Brown, Lowell R.; and Field, Nathaniel L., 4,102,182, Cl. 73-136.00R.
Finan, Michael Anthony: *See*—
Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, 4,102,701, Cl. 106-111.000.
Finck, Patricia A., to Colgate-Palmolive Company. Automatic dishwasher detergent with improved effects on overglaze. 4,102,799, Cl. 252-99.000.
Finger, Richard H.; and Michel, Thomas J., to Klykon, Inc. Ion projector head. 4,103,202, Cl. 313-336.000.
Finlay, John Reid, to Northern Telecom Limited. Synchronized push-pull inverter. 4,103,356, Cl. 363-22.000.
Finnell, Everett. Vehicle sewage hose support system. 4,102,523, Cl. 248-49.000.
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., to General Foods Corporation. Low cholesterol egg product and process. 4,103,040, Cl. 426-614.000.
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., to Merck & Co., Inc. Process to prepare novel antibiotic compounds. 4,102,882, Cl. 260-239.100.
Firestone Tire & Rubber Company, The: *See*—
Bohm, Georg Gustav Anton; and Skutnik, Bolesh J., 4,102,761, Cl. 204-159.200.
Bouton, Thomas Chester; and Futamura, Shingo, 4,102,849, Cl. 260-33.6AQ.
Fischer, Hans Peter: *See*—
Foery, Werner; and Fischer, Hans Peter, 4,102,668, Cl. 71-90.000.
Foery, Werner; and Fischer, Hans Peter, 4,102,670, Cl. 71-98.000.
Fischer, Laurin G., to International Telephone & Telegraph Corp. Radio jamming system. 4,103,237, Cl. 325-132.000.
Fischer, Wilhelm, to SKF Kugellagerfabriken GmbH. Clutch release bearing. 4,102,447, Cl. 192-110.00B.
Flaig, Hans; and Assmus, Friedrich, to Gebruder Junghans GmbH. Electronic alarm clock with a servicing arrangement for time adjustment. 4,102,120, Cl. 58-38.00R.
Fletcher, Aaron N.: *See*—
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,256, Cl. 331-94.50L.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,257, Cl. 331-94.50L.
Fletcher Sutcliffe Wild Limited: *See*—
Wake, Malcolm, 4,102,139, Cl. 61-45.00D.
Flinn, Peter John Livsey: *See*—
Levitt, Charlie Maurice; Chatterley, Samuel; and Flinn, Peter John Livsey, 4,103,137, Cl. 219-69.00W.
Flow Technology, Inc.: *See*—
Cohrs, Gary D., 4,102,189, Cl. 73-230.000.
Floyd, David: *See*—
Floyd, Robert D.; Gorman, Lee V.; and Thummel, David L., 4,103,332, Cl. 364-449.000.
Floyd, Robert D.; Gorman, Lee V.; and Thummel, David L., to Floyd, David. Mile post location display system. 4,103,332, Cl. 364-449.000.
Flury, Beat: *See*—
Weber, Bernhard Georg; and Flury, Beat, 4,102,339, Cl. 128-92.00E.
Flynn, M. Rutledge; and Schultz, Raymond P., to Control Devices, Inc. Heat control device. 4,102,495, Cl. 236-46.00R.
FMC Corporation: *See*—
Berkowitz, Sidney, 4,103,088, Cl. 544-190.000.
Knight, Houston W., 4,102,356, Cl. 137-614.060.
Nack, Michael R.; and Le Tourneau, Gary M., 4,102,111, Cl. 53-182.00R.
Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Pack, more particularly for cigarettes. 4,102,486, Cl. 229-37.00R.
Focke & Pfuhl: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,102,486, Cl. 229-37.00R.
Foerster, John E., to Foerster Process Systems, Inc. Cotton lint cleaner. 4,102,017, Cl. 19-203.000.
Foerster Process Systems, Inc.: *See*—
Foerster, John E., 4,102,017, Cl. 19-203.000.
Foerstner, Richard A.: *See*—
Copping, John R.; and Foerstner, Richard A., 4,102,041, Cl. 29-600.000.
Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. β-Halogenoethyl-silanes as plant growth regulators. 4,102,668, Cl. 71-90.000.
Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. Beta-halogenoethyl-silanes as plant growth regulators. 4,102,670, Cl. 71-98.000.
Fondronnier, Jacques: *See*—
Guillerm, Jean; and Fondronnier, Jacques, 4,102,371, Cl. 144-162.00R.
Ford Motor Company: *See*—
Brown, Lowell R.; and Field, Nathaniel L., 4,102,182, Cl. 73-136.00R.
Schwede, Otto G., 4,103,318, Cl. 361-388.000.
Weiner, Steven A., 4,102,042, Cl. 29-623.200.
Formenova, Galina Alexandrovna: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Forox Corporation: *See*—
Thompson, Edwin R., 4,102,029, Cl. 29-417.000.
Fors & Forss AB: *See*—
Fors, Henry, 4,102,458, Cl. 211-4.000.
Fors, Henry, to Fors & Forss AB. Device in racks for sales packages and the like. 4,102,458, Cl. 211-4.000.
Forsberg, Robin R. Garbage recycling system. 4,102,263, Cl. 100-74.000.
Foster, Carlton G., to Electric Power Research Institute, Inc. Response

time verification of in situ hydraulic pressure sensors in a nuclear reactor. 4,102,175, Cl. 73-4.00R.

Foster Farms: *See*—
Herrick, Duane, 4,102,015, Cl. 17-11.000.

Foster, Gerald W.: *See*—
Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., 4,103,268, Cl. 336-208.000.

Foster Grant Corporation: *See*—
Shelton, Robert N., 4,102,566, Cl. 351-131.000.

Foster, Lloyd, Sr. Fabric finishing machine. 4,102,058, Cl. 34-155.000.

Foster-Miller Associates, Inc.: *See*—
Hug, Hans Albert, 4,102,416, Cl. 175-227.000.

Foundation Equipment Corporation, The: *See*—
MacKinnon, Alan G., 4,102,094, Cl. 52-116.000.

Fournier, Pierre Louis Edmond; and Mayer, Jean Paul, to Produits Chimiques Ugine Kuhlmann. Pigmentary compositions based on esters of resin acids and amino-alcohols. 4,102,704, Cl. 106-288.00Q.

Fox, Adrian Samuel: *See*—
Robinson, Donald Nellis; and Fox, Adrian Samuel, 4,102,760, Cl. 204-159.180.

Fox, Rita T.: *See*—
Hauck, Frederic P.; and Fox, Rita T., 4,103,094, Cl. 560-231.000.

Fox, Robert Eugene; and Reece, Wendell Dale, to Deere & Company. Tank suspension. 4,102,540, Cl. 280-5.00H.

Fradeneck, Ronald J.; and Biancarelli, Edmund J., to Bethlehem Steel Corporation. Method and apparatus for determining the weight of slag on a bath of molten metal. 4,102,190, Cl. 73-302.000.

Franek, Jozef T.: *See*—
Brookes, Frederick D.; and Franek, Jozef T., 4,102,168, Cl. 72-117.000.

Frank, Amalie Julianna, to Bell Telephone Laboratories, Incorporated. Variable length codes for high quality image encoding. 4,103,287, Cl. 340-146.30H.

Frank, Egon, to Loewe-Opta GmbH. Circuit for the automatic scanning adjustment of a video tape in a video recorder. 4,103,313, Cl. 360-70.000.

Franz, William F.: *See*—
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,102,749, Cl. 201-2.500.

Frazier, William R., Jr., to General Dynamics Corp. System for transmission storage and/or multiplexing of information. 4,103,234, Cl. 325-38.00A.

Freeman, Albert A.: *See*—
Jackson, Clarence E.; and Freeman, Albert A., 4,103,067, Cl. 428-387.000.

Freeman, Charles R.; and Sauer, Charlotte I., to Minnesota Mining and Manufacturing Company. High strength adhesives, films and coatings. 4,102,835, Cl. 260-5.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Hoffmann, Herbert; and Wachendorf, Friedrich, 4,102,507, Cl. 242-18.0PW.
Weber, Dietmar, 4,103,355, Cl. 366-90.000.

Friedman, Patty R., executor: *See*—
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,102,815, Cl. 252-426.000.

Friedman, Ronald L., deceased (by Friedman, Patty R., executor); and Lewis, Roger N., to Argus Chemical Corporation. Alpha halo substituted asymmetrical diacyl peroxides in co-initiator systems. 4,102,815, Cl. 252-426.000.

Friedrich, Rainer: *See*—
Liebscher, Johannes; and Friedrich, Rainer, 4,102,000, Cl. 15-41.00R.

Frignoli, Luigi: *See*—
Gandini, Giuseppe; and Frignoli, Luigi, 4,102,794, Cl. 252-8.100.

Frohberger, Paul-Ernst: *See*—
Timmler, Helmut; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,102,891, Cl. 260-308.00R.

Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., to Westinghouse Electric Corp. Apparatus for gauging the texture of a conducting surface. 4,103,226, Cl. 324-61.00R.

Frost, Harold M.; and Szabo, Thomas L., to United States of America, Air Force. Electromagnetic ultrasound transducer. 4,102,207, Cl. 73-643.000.

Fuchs, Henry O., to Metal Improvement Company, Inc. Method and apparatus for measuring intensity of peening of small surfaces. 4,102,176, Cl. 73-12.000.

Fuji Electric Co., Ltd.: *See*—
Hamada, Toshiyoshi, 4,103,163, Cl. 250-344.000.

Fuji Kiko Company, Ltd.: *See*—
Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, 4,102,217, Cl. 74-492.000.

Fuji Oil Company, Limited: *See*—
Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, 4,103,039, Cl. 426-607.000.

Fuji Photo Film Co., Ltd.: *See*—
Sugiyama, Masatoshi; Sawaguchi, Hirosi; and Mitsui, Akio, 4,102,688, Cl. 96-139.000.

Fuji Photo Optical Co., Ltd.: *See*—
Suzuki, Masane; and Suzuki, Kiyoshi, 4,102,577, Cl. 356-169.000.
Suzuki, Masane; and Suzuki, Kiyoshi, 4,102,578, Cl. 356-120.000.

Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, to Dynic Corporation; and Kao Soap Co., Ltd. Process for producing artificial leather. 4,102,719, Cl. 156-78.000.

Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Water-insoluble, hydrophilic gels and a method for the preparation of the same. 4,102,842, Cl. 260-29.6PT.

Fujisawa, Makoto: *See*—
Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.

Fujishima, Daishiro; and Fujishima, Shinichiro, to Mitsubishi Shoji Kaisha, Ltd. Oxygen-consuming composition. 4,102,803, Cl. 252-188.000.

Fujishima, Shinichiro: *See*—
Fujishima, Daishiro; and Fujishima, Shinichiro, 4,102,803, Cl. 252-188.000.

Fujitsu Limited: *See*—
Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.

Fujizoki Pharmaceutical Co., Ltd.: *See*—
Sasaki, Toshio, 4,102,649, Cl. 23-259.000.

Fukuba, Kozo; Ogushi, Yasutomo; and Harada, Haruhisa, to Sumitomo Chemical Company, Limited. Fluid plaster composition. 4,102,697, Cl. 106-111.000.

Fukuda, Kenji: *See*—
Maeda, Yoshio; Matsumoto, Koichi; and Fukuda, Kenji, 4,102,576, Cl. 356-101.000.

Fukui, Masahiko; Sako, Hiromi; and Ogata, Masao, to Hitachi Metals, Ltd. Inductor with plurality of magnet pieces in air gap. 4,103,221, Cl. 323-92.000.

Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, to Sumitomo Chemical Company, Limited. Low profile unsaturated polyester resin composition. 4,102,944, Cl. 260-861.000.

Fulger, Charles V.; and Morfee, Thomas D., to Kellogg Company. Method for retaining softness in raisins. 4,103,035, Cl. 426-321.000.

Fulker, Mabel H., to Raymond Lee Organization, Inc., The, a part interest. Heart pacemaker monitor, alarm and auxiliary power supply. 4,102,346, Cl. 128-419.0PS.

Funsten, Stanard R.: *See*—
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., 4,102,411, Cl. 173-164.000.

Furka, Arpad: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, 4,102,948, Cl. 260-944.000.

Futaba Denshi Kogyo K. K.: *See*—
Eto, Goro; and Hikida, Chuichi, 4,103.206, Cl. 313-513.000.

Futamura, Shingo: *See*—
Bouton, Thomas Chester; and Futamura, Shingo, 4,102,849, Cl. 260-33.6AQ.

Gabriele, Leonard A.: *See*—
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.

Gacki, Leonard W.; and Daly, Robert E., to Picker Corporation. Fluid mixing and dispensing system. 4,103,358, Cl. 366-153.000.

GAF Corporation: *See*—
Golder, Michael D.; and Bernat, William M., 4,102,106, Cl. 52-533.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,102,993, Cl. 424-54.000.

Gagnon, Donald W., to Owens-Illinois, Inc. Coated polycarbonates and acrylics. 4,103,065, Cl. 428-336.000.

Gagnon, Real. Damage preventive device for swimming pools. 4,101,987, Cl. 4-172.000.

Gainer, Gordon C.: *See*—
Luck, Russell M.; and Gainer, Gordon C., 4,102,851, Cl. 260-37.0EP.

Gandini, Giuseppe; and Frignoli, Luigi, to Frignoli, Luigi; Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio. Fireproofing materials. 4,102,794, Cl. 252-8.100.

Gannicott, David James H. Counting and stacking unit. 4,102,253, Cl. 93-93.00C.

Gansert, Willi; and Zipperer, Martin, to Robert Bosch GmbH. Composite electric circuit structure of a printed circuit and heat generating discrete electrical component. 4,103,321, Cl. 361-388.000.

Gardner, Alvin Leonard; and Turley, Barry Jay, to General Electric Company. Dynamic drag arrangement for electrically propelled traction vehicles. 4,103,211, Cl. 318-87.000.

Gardner-Denver Company: *See*—
Nelson, Arvid L., 4,102,583, Cl. 407-25.000.

Gargiulo, Robert James: *See*—
Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., 4,102,747, Cl. 195-103.50C.

Garner, Robert; and Dunnenberger, Max, to Ciba-Geigy AG. Process for the manufacture of color formers of indoles and anhydrides of aromatic or heteroaromatic, vicinal dicarboxylic acids, new color formers of these classes of substance and their use. 4,102,893, Cl. 260-326.14R.

Garrett, Charles R.: *See*—
Crook, Edward J., Jr.; and Garrett, Charles R., 4,102,295, Cl. 116-114.00R.

Garrett Corporation, The: *See*—
Matulich, Dan S.; and Saylor, B. Franklin, 4,102,387, Cl. 165-1.000.
Schelp, Helmut R., 4,102,125, Cl. 60-39.530.

Gartner, Felix: *See*—
Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, 4,102,368, Cl. 141-250.000.

Gartung, Clifford W., to Pleion Corporation. Modular screen assembly. 4,102,095, Cl. 52-122.000.

Gasparrini, Luigi. High pressure household coffee machine. 4,102,255, Cl. 99-303.000.

Gaudlitz, Robert H.: *See*—
Hsiao, James C.; and Gaudlitz, Robert H., 4,102,282, Cl. 112-121.260.
Gay, Michel: *See*—
Crochemore, Michel; and Gay, Michel, 4,102,839, Cl. 260-23.0XA.
Gear, Adrian R. L., to University of Virginia, The. Continuous-flow, resistive-particle counting apparatus. 4,103,229, Cl. 324-71.0CP.
Gebr. Hofmann KG: *See*—
Hofmann, Dionys, 4,102,435, Cl. 187-8.500.
Gebruder Junghans GmbH: *See*—
Flaig, Hans; and Assmus, Friedrich, 4,102,120, Cl. 58-38.00R.
Gele, Pierre J.: *See*—
Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J., 4,102,313, Cl. 123-119.0EC.
Gendreu, Robert; and Chabah, Maurice, to Thomson-CSF. Air navigation and landing aid system. 4,103,300, Cl. 343-6.00R.
Gendron, George J.: *See*—
Phares, Lindsey J.; and Gendron, George J., 4,102,143, Cl. 61-94.000.
General Binding Corporation: *See*—
Staats, Henry N., 4,102,730, Cl. 156-499.000.
General Descaling Company Limited: *See*—
Platts, Douglas John, 4,102,474, Cl. 220-323.000.
General Dynamics Corp.: *See*—
Frazier, William R., Jr., 4,103,234, Cl. 325-38.00A.
General Electric Company: *See*—
Ashley, Eugene, 4,102,269, Cl. 102-38.0LP.
Borom, Marcus P., 4,102,689, Cl. 106-38.900.
Burgess, James F.; Girard, Roland T.; Martzloff, Francois D ; and Neugebauer, Constantine A., 4,103,274, Cl. 338-21.000.
Carr, Dennis James, 4,102,912, Cl. 260-463.000.
Cooper, Glenn Dale; and Katchman, Arthur, 4,102,850, Cl. 260-33.6AQ.
Crivello, James V., 4,102,687, Cl. 96-115.00R.
DeLaTorre, Pearline; and Beers, Melvin D., 4,102,852, Cl. 260-37.0SB.
Engeler, William E.; and Goldberg, Howard S., 4,103,343, Cl. 365-183.000.
Gardner, Alvin Leonard; and Turley, Barry Jay, 4,103,211, Cl. 318-87.000.
Hatch, Burton D., 4,102,221, Cl. 74-572.000.
LaRochelle, Ronald W., 4,102,941, Cl. 260-825.000.
Mosby, Frederick A., 4,103,201, Cl. 313-318.000.
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.
Noland, Joseph R.; and McCarty, William M., 4,102,391, Cl. 165-29.000.
Olander, Walter Karl, 4,102,865, Cl. 528-215.000.
Quinn, Clayton B., 4,102,934, Cl. 260-613.00R.
Roeder, Allan W.; Kimball, Richard M.; and Koschmeder, Richard F., 4,103,302, Cl. 343-9.000.
Smith, James; and Johnston, Richard Paul, 4,102,603, Cl. 416-244.00A.
Torossian, Kevork A.; and Lynn, Alexander L., 4,103,195, Cl. 310-259.000.
Uzgiris, Egidijus E., 4,102,990, Cl. 424-12.000.
Webb, William M., 4,102,556, Cl. 312-250.000.
Wendt, Michael E.; and Beaver, Danny D., 4,103,192, Cl. 310-64.000.
Wibbelsman, Robert C., 4,102,595, Cl. 415-1.000.
Williams, Frank J., III; and Donahue, Paul E., 4,102,905, Cl. 260-346.300.
General Foods Corporation: *See*—
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.
General Tire & Rubber Company, The: *See*—
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,102,971, Cl. 264-255.000.
Kuan, Tiong Ho; and Sommer, John George, 4,102,855, Cl. 260-42.330.
Genetti, Ralph A.; and Trivette, Chester D., Jr., to Monsanto Company. Composition and process for the preparation of segmented polyester-urethane polymers. 4,102,868, Cl. 260-858.000.
Genkina, Elena Vladimirovna: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Gerber, Arthur M.; and Walworth, Vivian K., to Polaroid Corporation. Method of electrolytically forming silver halide grains utilizing a novel cathode. 4,102,758, Cl. 204-94.000.
Gerber, Arthur M.; and Walworth, Vivian K., to Polaroid Corporation. Method of electrolytically forming silver halide grains utilizing a novel anode. 4,102,759, Cl. 204-94.000.
Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyolefin-block copolymer polycarbonate blends. 4,102,854, Cl. 260-42.180.
Gernhardt, Paul: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.
Gessman, Lawrence J. Remote, telephonic cardiac resuscitation device. 4,102,332, Cl. 128-2.10A.
Geurtsen, Alfonsus Antonius, to Machinefabriek Geurtsen Deventer, B.V. Apparatuses to separate mixtures of liquids of different specific gravities. 4,102,787, Cl. 210-104.000.
Geyer, Manvel A.: *See*—
Kernick, Andress; Ravas, Richard J.; and Geyer, Manvel A., 4,102,436, Cl. 187-29.00R.
Giegel, Joseph L.: *See*—
Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., 4,102,747, Cl. 195-103.50C.
Gillette Company, The: *See*—
Downing, Keith Stanley; and Johnston, Richard, 4,102,046, Cl. 30-346.530.
Gindi, Abraham M.; and Lang, Donald John, to International Business Machines Incorporated. Method and apparatus for allocating bandwidth on a loop system coupling a CPU channel to bulk storage devices. 4,103,336, Cl. 364-900.000.
Ginther, Elmer C.: *See*—
Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, 4,102,350, Cl. 134-130.000.
Giolito, Silvio L.; and Mirviss, Stanley B., to Stauffer Chemical Company. Preparation of meta-alkylphenols. 4,103,096, Cl. 568-783.000.
Girard, Roland T.: *See*—
Burgess, James F.; Girard, Roland T.; Martzloff, Francois D.; and Neugebauer, Constantine A., 4,103,274, Cl. 338-21.000.
Githens, Norman. Fireplace screen. 4,102,321, Cl. 126-140.000.
Glatthorn, Raymond H., to Westinghouse Electric Corp. Pneumatic hammer and welder. 4,103,140, Cl. 219-125.110.
Glaverbel-Mecaniver: *See*—
Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.
Glaxo Laboratories Limited: *See*—
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., to SmithKline Corporation. 8-Oxo-4-thia-1-azabicyclo (4.2.0)-oct-2-ene derivatives. 4,103,086, Cl. 544-47.000.
Gleave, Edward Roger, to Loctite (Ireland) Limited. Filled cyanoacrylate adhesive compositions. 4,102,945, Cl. 260-879.000.
Glick, Alvin L., to United States of America, Navy. Stabilized delay line oscillator. 4,103,251, Cl. 331-1.00A.
Global Marine, Inc.: *See*—
Anders, Edward O., 4,102,144, Cl. 61-103.000.
Glory Kogyo Kabushiki Kaisha: *See*—
Iizuka, Nobuhiro; and Hatanaka, Yoshihiro, 4,102,110, Cl. 53-59.00R.
Glover, Eugene G.: *See*—
Conway, Christopher J.; and Glover, Eugene G., 4,102,344, Cl. 128-419.00E.
Goetsch, Henry E.: *See*—
Mercik, Henry J., Jr.; and Goetsch, Henry E., 4,102,178, Cl. 73-49.700.
Goff, Paul Frederick; Knight, Bernard William; and Prentice, Kenneth James, to Potterton International Limited. Control apparatus for gas burning appliance. 4,102,628, Cl. 431-43.000.
Goffe, William L.; and Mammino, Joseph, to Xerox Corporation. Imaging member. 4,102,682, Cl. 96-1.50R.
Gold, Bernard. Machines for generating motion. 4,102,614, Cl. 418-59.000.
Gold, Joseph; and Farese, Frank, to Valcor Engineering Corp. Universal programmable process control apparatus. 4,102,492, Cl. 235-375.000.
Goldberg, Bruce S., to Amerace Corporation. Immobilized proteins. 4,102,746, Cl. 195-63.000.
Goldberg, Howard S.: *See*—
Engeler, William E.; and Goldberg, Howard S., 4,103,343, Cl. 365-183.000.
Goldberg, Ira B.: *See*—
Pilipovich, Donald; Goldberg, Ira B.; and Wagner, Ross I., 4,102,950, Cl. 423-579.000.
Golder, Michael D.; and Bernat, William M., to GAF Corporation. Siding panel. 4,102,106, Cl. 52-533.000.
Goldman, Robert Ivan. Stackable paint tray. 4,102,468, Cl. 220-69.000.
Golia, Salvatore. Below knee orthosis. 4,102,337, Cl. 128-80.00E.
Gomez, Richard Santiago; and Scray, Eugene James, Jr., to International Business Machines Corporation. Gas operated switches. 4,103,135, Cl. 200-185.000.
Gonzalez, Clemente Del Ser. Stuffing apparatus. 4,102,257, Cl. 99-494.000.
Goodlaxson, John D., to Maytag Company, The. Retaining ring assembly for faucet coupler. 4,102,544, Cl. 285-8.000.
Goodnight, Hershel E.: *See*—
Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., 4,102,627, Cl. 431-16.000.
Goodyear Tire & Rubber Company, The: *See*—
O'Mahoney, Joseph F., Jr., 4,103,077, Cl. 526-51.000.
Taylor, Challen E., 4,102,724, Cl. 156-149.000.
Throckmorton, Morford C.; and Saltman, William M., 4,102,817, Cl. 252-429.00B.
Goranson, Paul L.: *See*—
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,102,262, Cl. 100-53.000.
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian,

Genrikh Grigorievich. Process and apparatus for vacuum treatment of viscoplastic materials. 4,103,354, Cl. 366-88.000.

Gorman, Lee V.: *See*—
Floyd, Robert D.; Gorman, Lee V.; and Thummel, David L., 4,103,332, Cl. 364-449.000.

Gossling, Robert C.; and Miller, Gerald W., to Clopay Corporation. Window shade. 4,102,384, Cl. 160-263.000.

Gothard, David Olen; and Strobel, Gary Rudolph, to Huntington Alloys, Inc. Metal coating by a powder metallurgy technique. 4,102,678, Cl. 427-191.000.

Goto, Kenichi: *See*—
Kato, Taketoshi; Uchida, Masato; and Goto, Kenichi, 4,102,732, Cl. 156-645.000.

Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Battery operated lighter equipped with a battery operated timepiece. 4,102,631, Cl. 431-253.000.

Gould Inc.: *See*—
Albright, Roy H.; and Kelly, Walter B., 4,103,122, Cl. 200-48.00P.

Goupy, Marcel: *See*—
Dera, Alain; and Goupy, Marcel, 4,101,983, Cl. 2-412.000.

Grable, Jack W.; and Willeke, Steven A., to Essex Group, Inc. Thermostat and tip switch assembly. 4,103,269, Cl. 337-67.000.

Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, to Sprecher & Schuh Ltd. (SSA). Puffer interrupter with main and auxiliary pistons and common cylinder. 4,103,131, Cl. 200-148.00A.

Graf, Werner: *See*—
Deubzer, Bernward; and Graf, Werner, 4,102,970, Cl. 264-176.00R.

Grams, Wolfgang: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.

Gran-A-Stone Company, The: *See*—
Koopmeiners, Linus J., 4,102,319, Cl. 126-121.000.

Granco Equipment, Inc.: *See*—
Phillips, William A.; and Dietz, David R., 4,102,636, Cl. 432-30.000.

Grant, James L. Exhaust disposal system. 4,102,254, Cl. 98-115.00R.

Grayzel, Joseph; and Terrell, William, to Datascope Corporation. Device for transmitting electrical energy. 4,102,331, Cl. 128-2.10E.

Grecksch, Hans: *See*—
Raasch, Hans; and Grecksch, Hans, 4,102,506, Cl. 242-18.0DD.

Green, Norman W.; Duraiswamy, Kandaswamy; and Lumpkin, Robert E., to Occidental Petroleum Corporation. Pyrolysis with cyclone burner. 4,102,773, Cl. 208-8.000.

Green, Samuel I., to McDonnell Douglas Corporation. High speed photodetector and system. 4,103,157, Cl. 250-239.000.

Green, Walter K.: *See*—
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.

Greenspan, David Charles: *See*—
Hench, Larry Leroy; and Greenspan, David Charles, 4,103,002, Cl. 428-155.000.

Greenwald, Richard B., to Polaroid Corporation. 4-Hydroxypyrazole developing agents. 4,102,684, Cl. 96-61.00M.

Greer Hydraulics, Inc.: *See*—
Zahid, Abduz, 4,102,465, Cl. 220-3.000.

Greever, James E.; and Schafer, James P., to Carrier Corporation. Spine finned tube. 4,102,027, Cl. 29-157.3AH.

Gregory, Gordon Ian: *See*—
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.

Greulich, Thomas A. Nonwelded metal grating. 4,102,102, Cl. 52-338.000.

Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., to GTE Sylvania Incorporated. Ceramic enveloped electrical heating element. 4,103,277, Cl. 338-237.000.

Griffin, Warren R., to United States of America, Air Force. Fluorocarbon triazine polymers. 4,102,872, Cl. 528-362.000.

Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Electrical conducting phthalonitrile polymers. 4,102,873, Cl. 528-331.000.

Griner, Donald B.: *See*—
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Groschl, Johann: *See*—
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Groschl, Josef: *See*—
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Groschl, Ludwig: *See*—
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, to Hahn, Stefan; Drescher, Norbert; and Johann Groschl, Firma. Furnace plant. 4,102,279, Cl. 110-234.000.

Gross, Frank Robert; and Gross, Rubie Cook. Insulating panel. 4,102,099, Cl. 52-171.000.

Gross, Rubie Cook: *See*—
Gross, Frank Robert; and Gross, Rubie Cook, 4,102,099, Cl. 52-171.000.

Groves, James D.; and D'Zuro, Deborah Sue Anne, to Minnesota Mining and Manufacturing Company. Two-part reactive dielectric filler composition. 4,102,716, Cl. 156-48.000.

Growden, Norman Wills: *See*—
Modra, Theodor Victor; and Growden, Norman Wills, 4,102,109, Cl. 53-24.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., 4,103,268, Cl. 336-208.000.

GTE Lenkurt Electric (Canada) Ltd.: *See*—
Huntley, Christopher Ryland, 4,103,220, Cl. 323-19.000.

GTE Sylvania Incorporated: *See*—
Andrade, Ralph W.; and Duncan, Alexander W., 4,102,043, Cl. 29-739.000.
Burdick, Kenneth John, 4,103,249, Cl. 330-288.000.
Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., 4,103,277, Cl. 338-237.000.
Levin, Robert E., 4,103,175, Cl. 250-504.000.
Schulze, Harry O.; Dodds, Robert E.; and Herner, Raymond F., 4,103,069, Cl. 428-403.000.

Gualano, Emil V. Universal antenna mount. 4,103,305, Cl. 343-715.000.

Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., to Martin Marietta Corporation. Disposable booster. 4,102,270, Cl. 102-49.500.

Guard, Twyman. Film wrapping dispenser. 4,102,513, Cl. 242-75.400.

Guarderas, Fernando V.; and Leon, Luis, to Dataproducts Corporation. Impact printer type character. 4,102,268, Cl. 101-399.000.

Gubin, Jean; and Rosseels, Gilbert, to Labaz. Indolizine derivatives, pharmaceutical compositions and methods containing same. 4,103,012, Cl. 424-263.000.

Guenin, Andre: *See*—
Zellweger, Conrad; and Guenin, Andre, 4,102,633, Cl. 431-152.000.

Guhl & Scheibler AG: *See*—
von Ballmoos, Fritz, 4,103,150, Cl. 235-419.000.

Guignard, Claude: *See*—
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Guillerm, Jean; and Fondronnier, Jacques, to Centre Technique du Bois. Apparatus for cutting various materials. 4,102,371, Cl. 144-162.00R.

Gulf Research & Development Company: *See*—
Beuther, Harold; Innes, Robert A.; and Swift, Harold E., 4,102,914, Cl. 260-465.300.
Carr, Norman L.; and McGinnis, Edgar L., 4,102,774, Cl. 208-8.000.
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,102,919, Cl. 260-520.00E.
Onopchenko, Anatoli; and Schulz, Johann G., 4,102,932, Cl. 260-609.00R.

Gullick Dobson Limited: *See*—
Allen, Archelaius Dawson, 4,102,140, Cl. 61-45.00D.

Gustafson, Douglas C.: *See*—
Cook, David M.; and Gustafson, Douglas C., 4,102,987, Cl. 423-466.000.

Gustin, Grant M., to Morton-Norwich Products, Inc. Oxygen scavenger in elemental combustion analyses. 4,102,814, Cl. 252-408.000.

Gutnick, Morton. Process for the prevention of venereal disease. 4,102,998, Cl. 424-115.000.

Gylland, Ernest F., Jr.: *See*—
Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., 4,102,149, Cl. 62-196.00A.

H. A. Schlatter AG: *See*—
Zollinger, Hans R., 4,103,139, Cl. 219-101.000.

H. B. Fleming, Inc.: *See*—
Ingalls, Richard L., 4,102,141, Cl. 61-53.500.

H. H. Robertson Company: *See*—
Kautz, Glenn E., 4,103,059, Cl. 428-178.000.

H. Kohnstamm & Company Inc.: *See*—
Koch, Louis; Dunn, Michael; and Lumpkin, Charles, 4,102,848, Cl. 260-31.600.

Haak, Willard J.: *See*—
Marsden, Howard A.; and Haak, Willard J., 4,102,425, Cl. 180-66.00F.

Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, to International Business Machines Corporation. Non-destructive readout scheme for holographic storage system. 4,103,346, Cl. 365-216.000.

Haas, Helmut; and Baulig, Klaus-Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method of and means for safely releasably tensioning structural parts such as clamping members. 4,102,589, Cl. 403-373.000.

Haas, James R. Material sensing device. 4,103,292, Cl. 340-603.000.

Haberle, Friedrich: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,102,594, Cl. 408-186.000.

Hackbarth, Richard W.; and Puariea, Douglas A., to Maxson Corporation, The. Railway flat car hand brake system. 4,102,212, Cl. 74-89.220.

Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., to Shell Oil Company. Control of weeds with N-substituted alanine compounds. 4,102,671, Cl. 71-98.000.

Haertl, Hanns-Dietmar: *See*—
Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, 4,102,871, Cl. 528-324.000.

Hagen, Alexander: *See*—
Klose, Sigmar; and Hagen, Alexander, 4,102,742, Cl. 195-103.50R.

Haggard, Richard A.: *See*—
Lewis, Sheldon N.; and Haggard, Richard A., 4,103,093, Cl. 560-205.000.

Hahn, Stefan: *See—*
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.
Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,102,929, Cl. 260-590.0FA.
Halbeck, Werner B.: *See—*
Hults, Harold W.; and Halbeck, Werner B., 4,103,127, Cl. 200-67.00G.
Halfhill, Martin O.: *See—*
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
Hall, Guy E.: *See—*
Yates, Chester Robert; and Hall, Guy E., 4,101,993, Cl. 5-267.000.
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Process for producing substituted-1-acetyl-3,3-dimethylcyclohexane. 4,102,928, Cl. 260-586.00C.
Hall, John B.: *See—*
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.
Hall, John Matthew, to Rolls Royce (1971) Limited. Gas turbine powerplants. 4,102,499, Cl. 239-265.270.
Hallmor, Inc.: *See—*
Cousins, James R., 4,102,245, Cl. 90-12.00R.
Ham, William Edward, to RCA Corporation. Method for determining whether holes in dielectric layers are opened. 4,103,228, Cl. 324-65.00R.
Hamada, Toshiyoshi, to Fuji Electric Co., Ltd. Infrared gas analyzing apparatus. 4,103,163, Cl. 250-344.000.
Hamade, Adib R.: *See—*
Albarran, Jose F.; and Hamade, Adib R., 4,103,186, Cl. 307-251.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label applying apparatus. 4,102,731, Cl. 156-540.000.
Hammann, Ingeborg: *See—*
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.
Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.
Hammarlund, Gudmar, to ASEA AB. Resistance thermometer measuring system. 4,102,198, Cl. 73-362.0AR.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Energy. Azacoumarin dye lasers. 4,103,256, Cl. 331-94.50L.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Energy. Azaquinolone dye lasers. 4,103,257, Cl. 331-94.50L.
Hancu, Theodore, to Societe d'Exploitation de Brevets J.B. Wiper blade structure for vehicles. 4,102,003, Cl. 15-250.420.
Hanes Corporation: *See—*
Bell, Cecil R., 4,102,727, Cl. 156-251.000.
Hanlon & Wilson Company: *See—*
Lowerre, Ralph T., 4,102,497, Cl. 238-14.800.
Hannah, Bruce R.: *See—*
Morrison, Andrew I.; and Hannah, Bruce R., 4,102,549, Cl. 297-383.000.
Hannemann, Franz, to Durkoppwerke GmbH. Feed device for flexible workpieces, especially for a sewing machine. 4,102,280, Cl. 112-121.260.
Hanning Elektro-Werke: *See—*
Hanning, Robert, 4,102,973, Cl. 264-272.000.
Hanning, Robert, to Hanning Elektro-Werke. Method of producing an excitation coil for shaded pole electric motors. 4,102,973, Cl. 264-272.000.
Hansen, Albert Frederick. Diaphragm multi-port valve assembly. 4,102,355, Cl. 137-596.150.
Hansen, Lowell D.: *See—*
Huber, Melvin F.; and Hansen, Lowell D., 4,102,606, Cl. 417-204.000.
Hara, Ichizo: *See—*
Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, 4,102,983, Cl. 423-245.000.
Hara, Katsuaki: *See—*
Uyama, Noboru; and Hara, Katsuaki, 4,102,420, Cl. 177-25.000.
Hara, Shoji: *See—*
Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, 4,102,021, Cl. 29-25.420.
Harada, Haruhisa: *See—*
Fukuba, Kozo; Ogushi, Yasutomo; and Harada, Haruhisa, 4,102,697, Cl. 106-111.000.
Hardwick, John R.: *See—*
Martin, James W.; and Hardwick, John R., 4,102,285, Cl. 113-54.00R.
Hargraves, Donald E. Solenoid valve. 4,102,526, Cl. 251-139.000.
Harnee Pty. Ltd.: *See—*
Nielsen, Carl Philip; and Wood, Noel Sydney Davidson, 4,102,101, Cl. 52-263.000.
Harnish, James Ranck; and Raffensberger, Larry Allan, to Borg-Warner Corporation. Control system for heat pump and furnace combination. 4,102,390, Cl. 165-29.000.
Harnsberger, Bobby G., to Texaco Inc. Method of forming gravel packs. 4,102,398, Cl. 166-276.000.
Harnsberger, Bobby G., to Texaco Inc. Consolidated sand control pack. 4,102,399, Cl. 166-276.000.
Harper, James H.; and Smith, Linda S., to Minnesota Mining and Manufacturing Company. Retroreflective transfer sheet material. 4,102,562, Cl. 350-105.000.
Harris, Frank John Turner, to Evans, Adlard & Company Limited. Disposable filter element. 4,102,792, Cl. 210-457.000.
Harris, Jesse R., to Phillips Petroleum Company. Cycloparaffin isomerization using a catalytically active aluminum halide intercalated in graphite. 4,102,937, Cl. 260-666.00P.
Harris, Jesse R.: *See—*
Myers, John W.; and Harris, Jesse R., 4,102,939, Cl. 260-683.00D.
Harris, Roger J. Digital fuel gauge. 4,102,191, Cl. 73-313.000.
Harris, William F. Insect control system. 4,102,093, Cl. 52-101.000.
Hart, William A.; and Klinikowski, James J., to Air Products & Chemicals, Inc. Coulometric electrolytic timing device with coaxially aligned electrodes. 4,103,296, Cl. 340-309.100.
Hartco Company: *See—*
Pearson, Kenneth Carlton; and Lingle, Harrison Church, 4,102,586, Cl. 403-188.000.
Hartford, Winslow H., to Koppers Company, Inc. Method for preparing copper arsenate compositions. 4,103,000, Cl. 424-133.000.
Harth, Carl A. Grip measuring device. 4,102,049, Cl. 33-1.00B.
Hartmann, Alfons: *See—*
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.
Hartmann & Brawn Aktiengesellschaft: *See—*
Hartmann, Karl; and Treis, Wolfgang, 4,102,648, Cl. 23-254.0EF.
Hartmann, Heinrich; and Sander, Hans, to BASF Aktiengesellschaft. Baking finishes of low solvent content. 4,102,847, Cl. 260-31.40R.
Hartmann, Karl; and Treis, Wolfgang, to Hartmann & Brawn Aktiengesellschaft. Measuring non-methane hydrocarbon contents in gases. 4,102,648, Cl. 23-254.0EF.
Hartmann, Werner: *See—*
Danielmeyer, Hans-Gunter; and Hartmann, Werner, 4,103,173, Cl. 250-483.000.
Harvey, Francis J.: *See—*
Mazelsky, Robert; Fey, Maurice G.; and Harvey, Francis J., 4,102,767, Cl. 204-164.000.
Harvey, Francis J., II; and Fey, Maurice G., to Westinghouse Electric Corp. High purity silicon production by arc heater reduction of silicon intermediates. 4,102,764, Cl. 204-164.000.
Harvey, Francis J., II, to Westinghouse Electric Corp. Arc heater production of silicon involving a hydrogen reduction. 4,102,985, Cl. 423-350.000.
Harvey, Francis J., II: *See—*
Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, 4,102,765, Cl. 204-164.000.
Hashimoto, Isao: *See—*
Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, 4,102,834, Cl. 260-4.0AR.
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, to R. Alkan & Cie. Dual-purpose ejector for aircraft load jettisoning mechanism. 4,102,520, Cl. 244-137.00R.
Hassiotis, Panayiotis: *See—*
Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, 4,102,986, Cl. 423-402.000.
Hastings, Phillip. Modular heat recuperator. 4,102,632, Cl. 432-3.000.
Hasty, Robert Armistead: *See—*
Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, 4,102,986, Cl. 423-402.000.
Hatanaka, Yoshihiro: *See—*
Iizuka, Nobuhiro; and Hatanaka, Yoshihiro, 4,102,110, Cl. 53-59.00R.
Hatch, Burton D., to General Electric Company. Cross-ply composite flywheel. 4,102,221, Cl. 74-572.000.
Hattori, Eiji: *See—*
Watanabe, Seizaburo; Hattori, Eiji; and Mori, Kanau, 4,102,829, Cl. 521-81.000.
Hattori, Tadashi: *See—*
Ueyama, Fumio; and Hattori, Tadashi, 4,102,483, Cl. 228-244.000.
Hauck, Frederic P.; and Fox, Rita T., to E. R. Squibb & Sons, Inc. Cyclohexanetetrol alkanoates. 4,103,094, Cl. 560-231.000.
Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Cyclitolamines. 4,103,095, Cl. 560-252.000.
Hauser, Peter Jacob; Hendrix, James Easton; and Kuhn, Hans Heinrich, to Milliken Research Corporation. Tint compositions for nylon having improved fugitivity properties. 4,102,644, Cl. 8-164.000.
Hawk, Robert M.; and Thiel, Frank L., to Corning Glass Works. Optical waveguide connector. 4,102,561, Cl. 350-96.210.
Hawker Siddeley Aviation Limited: *See—*
Charlton, Mark, 4,102,357, Cl. 137-625.320.
Hawker Siddeley Dynamics Limited: *See—*
Moss, Colin Roy, 4,103,160, Cl. 250-334.000.
Hawkes, David A.; Robson, Alan L.; and Uemlianin, Andray, to British Steel Corporation. Rotating furnaces. 4,102,530, Cl. 266-46.000.
Hawkins, Charles A.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.
Hayamizu, Mamoru; and Tanigaki, Yasushi, to Kabushiki Kaisha Daini Seikosha. Method for optically measuring a distance. 4,102,571, Cl. 356-1.000.

Hayashi, Shigeo: *See*—
Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, 4,102,962, Cl. 264-82.000.
Hayes, Carlos F., to Tally Corporation. Stepping motor closed loop constant velocity control system. 4,103,216, Cl. 318-685.000.
Hayes, Norman J. Animal identification tag. 4,102,073, Cl. 40-301.000.
Hazime, Nitta: *See*—
Toshiyasu, Ishimaru; Minoru, Hatanaka; Mariko, Hatamura; and Hazime, Nitta, 4,103,008, Cl. 424-246.000.
Head, Brian Arthur; and Kimball, Philip C., to Whatman Reeve Angel Limited. Method of manufacturing an inside-to-outside flow filter tube. 4,102,736, Cl. 162-104.000.
Head, Brian Arthur; and Kimball, Philip C., to Whatman Reeve Angel Limited. Inside-to-outside flow filter tube and method of using same. 4,102,785, Cl. 210-65.000.
Hebborn, Peter, to Westwood Pharmaceuticals Inc. Tar gel formulation. 4,102,995, Cl. 424-81.000.
Hechtl, Wolfgang: *See*—
Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, 4,102,860, Cl. 528-18.000.
Hedges, Richard A.; and Pearl, Maurice H., to Electrooxidation Systems, Inc. Ore treatment electrolytic cell. 4,102,754, Cl. 204-275.000.
Heifetz, Haim. Building method and equipment for use therewith. 4,102,956, Cl. 264-32.000.
Heinze, Alvin L., to Hydraulics Unlimited Manufacturing Co. Tag wheel lift. 4,102,424, Cl. 180-24.020.
Heller, Milton David: *See*—
Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,103,028, Cl. 424-315.000.
Hellkotter, Wolfgang: *See*—
Peddinghaus, Carl Ullrich; Hellkotter, Wolfgang; Einhaus, Albert; and Buschmann, Karl Robert, 4,102,228, Cl. 83-156.000.
Hemala, Zdenek; Nudinger, Guenter; and Wehrmeister, Gerhard, to Saurer-Allma GmbH. Compressed air supply arrangement for a service carriage. 4,102,115, Cl. 57-34.00R.
Hempel, Raymond O., Jr.: *See*—
Voglrieder, Leonhard; and Hempel, Raymond O., Jr., 4,102,035, Cl. 29-568.000.
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, to International Business Machines Corporation. Antiferromagnetic-ferromagnetic exchange bias films. 4,103,315, Cl. 360-110.000.
Hench, Larry Leroy; and Greenspan, David Charles, to Board of Regents, University of Florida. Bioglass coated A1203 ceramics. 4,103,002, Cl. 428-155.000.
Hendrix, James Easton: *See*—
Hauser, Peter Jacob; Hendrix, James Easton; and Kuhn, Hans Heinrich, 4,102,644, Cl. 8-164.000.
Hennecke, Klaus: *See*—
Stepan, Walter; and Hennecke, Klaus, 4,101,980, Cl. 2-9.000.
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., to Motorola, Inc. Method of packaging electronic components. 4,102,039, Cl. 29-593.000.
Henry, Ronald A.: *See*—
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,256, Cl. 331-94.50L.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,257, Cl. 331-94.50L.
Hensel, Paul Christopher, to Post Office, The. Dielectric optical waveguide couplings. 4,102,717, Cl. 156-64.000.
Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Processes for treating a heavy petroleum hydrocarbon stream containing metals and asphaltenes. 4,102,779, Cl. 208-211.000.
Heraeus-Schott Quarzschmelze GmbH: *See*—
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.
Herb, Armin; Leibhard, Erich; and Uhlig, Raimer, to Hilti Aktiengesellschaft. Angle-shaped support member. 4,102,587, Cl. 403-205.000.
Herbenar, Edward John, to TRW Inc. Ball joint. 4,102,585, Cl. 403-138.000.
Herbst, George J. Personal clothes washboard device. 4,102,160, Cl. 68-229.000.
Hercofina: *See*—
Hood, Horace Edward, 4,103,090, Cl. 560-3.000.
Hercsel nee Szepespataki, Jolan: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, 4,102,948, Cl. 260-944.000.
Hercules Incorporated: *See*—
Buntin, George A., 4,102,673, Cl. 71-120.000.
Cherry, Charles C., 4,102,498, Cl. 239-265.190.
Herculite Protective Fabrics Corporation: *See*—
Kydonieus, Agis F., 4,102,991, Cl. 424-27.000.
Hermann, Joachim, to Boelkow Entwicklungen KG. System for signal coding. 4,102,521, Cl. 244-3.110.
Herner, Raymond F.: *See*—
Schulze, Harry O.; Dodds, Robert E.; and Herner, Raymond F., 4,103,069, Cl. 428-403.000.
Herold, Robert J.: *See*—
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,102,971, Cl. 264-255.000.
Herrick, Duane, to Foster Farms. Method and apparatus for processing poultry feet and the like. 4,102,015, Cl. 17-11.000.
Hertel, Douglas Leo; and Lee, Robert Wen, to International Basic Economy Corporation. Process for coagulating polymer latices using screw-type extruder. 4,103,074, Cl. 528-487.000.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 4,102,894, Cl. 260-332.30R.
Hess, Howard V.; Franz, William F.; and Cole, Edward L., to Texaco Inc. Process for making oil from aqueous reactive sludges and slurries. 4,102,749, Cl. 201-2.500.
Hesston Corporation: *See*—
White, Allen A., 4,102,260, Cl. 100-24.000.
White, Allen A., 4,102,261, Cl. 100-24.000.
Hewlett-Packard Company: *See*—
Bradley, Havyn E., 4,103,182, Cl. 307-203.000.
Hiebert, Inc.: *See*—
Timmons, Jay, 4,102,470, Cl. 220-22.300.
Hieda, Shozo: *See*—
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
Hiemeleers, Jozef; De Schepper, Achille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Treatment of ores or metallurgical by-products containing arsenic and antimony. 4,102,976, Cl. 423-87.000.
Hihara, Sokichi; Horiuchi, Mikio; and Ohe, Takeshi, to Kabushiki Kaisha Nippon Coinco. Low frequency medical treatment apparatus. 4,102,348, Cl. 128-422.000.
Hikida, Chuichi: *See*—
Eto, Goro; and Hikida, Chuichi, 4,103,206, Cl. 313-513.000.
Hildebrandt, Peter; Veranneman, Georg; and Schottroff, Werner, to Linde Aktiengesellschaft. Casting apparatus. 4,102,386, Cl. 164-259.000.
Hill, William Harvey: *See*—
De Gelder, Jacob; Hill, William Harvey; and Englhard, Ronald F., 4,102,501, Cl. 239-511.000.
Hilti Aktiengesellschaft: *See*—
Herb, Armin; Leibhard, Erich; and Uhlig, Raimer, 4,102,587, Cl. 403-205.000.
Thurner, Elmar, 4,102,238, Cl. 85-10.00E.
Hiraoka, Takashi: *See*—
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
Hirayama, Kazuhiro: *See*—
Masaki, Katsumi; Hirayama, Kazuhiro; and Sato, Yasushi, 4,103,156, Cl. 250-236.000.
Hirota, Moriyuki: *See*—
Okada, Hiroo; Hirota, Moriyuki; and Uesugi, Masaaki, 4,102,786, Cl. 210-80.000.
Hirukawa, Yoshinori: *See*—
Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, 4,103,039, Cl. 426-607.000.
Hiscutt, Robert: *See*—
Kearin, Martin John; Hiscutt, Robert; and Molineux, Peter, 4,102,768, Cl. 204-192.00P.
Hitachi, Ltd.: *See*—
Maeda, Yoshio; Matsumoto, Koichi; and Fukuda, Kenji, 4,102,576, Cl. 356-101.000.
Hitachi Metals, Ltd.: *See*—
Fukui, Masahiko; Sako, Hiromi; and Ogata, Masao, 4,103,221, Cl. 323-92.000.
Hitco: *See*—
Lee, George, 4,102,142, Cl. 61-86.000.
Hittmair, Paul: *See*—
Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, 4,102,860, Cl. 528-18.000.
Hizikata, Tosihiko, to NGK Insulators, Ltd. Electrical insulators having semi-conducting glaze and conductive Portland cement containing a specified amount of carbon black. 4,103,103, Cl. 174-140.00C.
Hobbs, William H.: *See*—
Carroll, Charles E.; and Hobbs, William H., 4,102,431, Cl. 182-5.000.
Hodel, Christian, to Sandoz Ltd. Use of 4aRS,5SR,9bRS-2-ethyl-1,3,4,4a,5,9b-hexahydro-7-methyl-5-p-tolyl-2H-indeno[1,2-c]pyridines in inhibiting spermatogenesis. 4,103,014, Cl. 424-267.000.
Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Antiallergic cyclic sulphur compounds. 4,103,015, Cl. 424-269.000.
Hoechst Aktiengesellschaft: *See*—
Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, 4,102,793, Cl. 252-8.100.
Volkwein, Gert; and Baessler, Konrad, 4,102,927, Cl. 260-581.000.
Hofer, Gerhard: *See*—
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.
Hofer, Kurt: *See*—
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 4,102,857, Cl. 260-45.80N.
Hoff, Stephen J., to Hoffco, Inc. Variable-speed pulley and clutch. 4,102,214, Cl. 74-230.17E.
Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,102,214, Cl. 74-230.17E.
Hoffmann, Herbert; and Wachendorf, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Formation of reserve winding for further connection on bobbins of textile machines. 4,102,507, Cl. 242-18.0PW.
Hoffmann-La Roche Inc.: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,102,909, Cl. 260-404.000.

Christenson, James Gordon, 4,102,979, Cl. 424-1.000.
Cohen, Noal; and Saucy, Gabriel, 4,102,925, Cl. 260-570.600.
Hajos, Zoltan George; and Parrish, David Richard, 4,102,929, Cl. 260-590.0FA.
Li, Choh Hao, 4,103,005, Cl. 424-177.000.

Hofmann, Dionys, to Gebr. Hofmann KG. Mechanical safety unit on spindle-driven lifts. 4,102,435, Cl. 187-8.500.

Hofmann, Peter; Muller, Helmut; and Rody, Jean, to Ciba-Geigy Corporation. Modified polyurethanes with increased light stability. 4,102,870, Cl. 528-73.000.

Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of pregnane derivatives. 4,102,908, Cl. 260-397.400.

Hogan, Philip John: *See—*
Jennings, James Robert; and Hogan, Philip John, 4,102,915, Cl. 260-465.9OD.

Hogervorst, Johannes R.: *See—*
van Steveninck, Johannes; and Hogervorst, Johannes R., 4,102,145, Cl. 61-105.000.

Holden, Kenneth G.: *See—*
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,103,086, Cl. 544-47.000.

Holder, Charles B., to Sumrall, James A. Tire bead breaker machine. 4,102,380, Cl. 157-1.260.

Holland, John Anthony, to Avion Australia Pty Ltd. Adjustable height bed. 4,101,990, Cl. 5-63.000.

Hollandsche Beton Groep NV: *See—*
Jansz, Joost W., 4,102,147, Cl. 61-53.500.

Holm, LeRoy W.: *See—*
Ransom, Robert C.; and Holm, LeRoy W., 4,102,396, Cl. 166-252.000.

Holstein & Kappert Aktiengesellschaft: *See—*
Jordan, Heinrich; and Sindermann, Siegmar, 4,102,365, Cl. 141-39.000.

Holstein und Kappert Aktiengesellschaft: *See—*
Wiendahl, Joachim; Jendrichowski, Klaus; and Sushradt, Wolfgang, 4,102,351, Cl. 134-129.000.

Holtermann, Ludwig K. Heat sensor. 4,102,196, Cl. 73-341.000.

Homan, William N.; and Smock, Steve W., to P. R. Mallory & Co. Inc. Timing mechanism having independently operated plural cam assemblies. 4,103,119, Cl. 200-35.00R.

Homeyer, Bernhard: *See—*
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kamiya, Tadashi, 4,102,379, Cl. 152-405.000.

Honeywell Inc.: *See—*
Braitberg, Michael F., 4,103,214, Cl. 318-326.000.
Keller, Hans W., 4,103,273, Cl. 338-2.000.
Stauffer, Norman L., 4,103,152, Cl. 250-204.000.

Honig, Helmut, to Vianova Kunstharz, A.G. Measuring device and process for recording on electrodeposition parameters of throwing power. 4,102,771, Cl. 204-299.0EC.

Hood, Horace Edward, to Hercofina. Stabilization with alkali metal acetate material of certain thermally unstable DMT. 4,103,090, Cl. 560-3.000.

Hood, Robert Allen: *See—*
Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, 4,103,329, Cl. 364-200.000.

Hopkins, Carl E., to Dayco Corporation. Hose construction. 4,102,360, Cl. 138-127.000.

Hoppe, Lutz: *See—*
Bohmer, Branislav; and Hoppe, Lutz, 4,103,080, Cl. 526-303.000.

Hopping, Russell L.: *See—*
Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., 4,102,270, Cl. 102-49.500.

Horiba, Ltd.: *See—*
Iwamoto, Michinori; and Nomura, Toshiyuki, 4,103,162, Cl. 250-343.000.

Horigome, Hirofumi, to Ricoh Co., Ltd. Method and apparatus for adjusting the view finder of a single-lens reflex camera. 4,103,311, Cl. 354-152.000.

Horiuchi, Mikio: *See—*
Hihara, Sokichi; Horiuchi, Mikio; and Ohe, Takeshi, 4,102,348, Cl. 128-422.000.

Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, to BASF Aktiengesellschaft. Copolyamides from lactam and diamine salts of two different dicarboxylic acids. 4,102,871, Cl. 528-324.000.

Hornig, Heinz: *See—*
Schwinum, Ernst; Hornig, Heinz; and Matner, Martin, 4,102,844, Cl. 260-29.70T.

Hornle, Reinhold: *See—*
Baurecht, Heinz-Ewald; and Hornle, Reinhold, 4,102,892, Cl. 260-314.500.

Horowitz, Richard D.: *See—*
Spound, Albert M.; and Horowitz, Richard D., 4,102,275, Cl. 108-92.000.

Horvath, Aniko: *See—*
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, 4,102,948, Cl. 260-944.000.

Hoshimi, Susumu: *See—*
Ikegami, Keisuke; and Hoshimi, Susumu, 4,103,197, Cl. 310-267.000.

Hounsfield, Godfrey Newbold, to EMI Limited. Apparatus for examining bodies by means of penetrating radiation. 4,103,169, Cl. 250-445.00T.

Houston Well Screen Company: *See—*
Robinson, Wiley B., 4,102,395, Cl. 166-231.000.

Howarth, Barrie D.; and Kobylecki, Ryszard J., to Oce-Andeno B.V. Process for preparing a S-trialkoxy benzene. 4,102,933, Cl. 260-613.00D.

Howatt, Glenn N.; and Leonard, Murray, to Vernitron Corporation. Wave filter and process for making same. 4,103,264, Cl. 333-72.000.

Howe, Francis M.; and Yin, Simon. Leak sensor and indicating system for vacuum circuit interrupters. 4,103,291, Cl. 340-522.000.

Hoyt, F. Russell. Combination beach bag and blanket. 4,101,994, Cl. 5-344.000.

Hsiao, James C.; and Gaudlitz, Robert H., to Union Special Corporation. Metering device for sewing machines. 4,102,282, Cl. 112-121.260.

Hsieh, Paul Y.; and Rogall, Eugene W., to Ing. C. Olivetti & C., S.p.A. Thermographic printing method. 4,103,043, Cl. 427-49.000.

Hubbell, Wayne C.; and Chang, Christopher T., to United States of America, Air Force. Acoustic surface wave bubble switch. 4,103,339, Cl. 365-1.000.

Huber, Melvin F.; and Hansen, Lowell D., to Sundstrand Corporation. Multiple displacement pump system having control sequence for unloading valve. 4,102,606, Cl. 417-204.000.

Hubert, Yves: *See—*
Poirier, Raymond; Hubert, Yves; and Lakhoua, Noureddine, 4,103,333, Cl. 364-824.000.

Huckins, James N.: *See—*
Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,102,816, Cl. 252-428.000.

Huffman, William F.: *See—*
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,103,086, Cl. 544-47.000.

Hug, Hans Albert, to Foster-Miller Associates, Inc. Stabilized conical boring tool. 4,102,416, Cl. 175-227.000.

Hughes Aircraft Company: *See—*
Buchman, William W., 4,103,260, Cl. 332-7.510.
Evans, Norol T., 4,103,301, Cl. 343-7.700.
Maeding, Dale G., 4,103,109, Cl. 179-15.00A.
McGreivy, Denis J.; Peterson, Henry T.; and Leupp, Alex M., 4,103,297, Cl. 340-324.00M.
O'Meara, Thomas R., 4,102,572, Cl. 356-5.000.
Weglein, Rolf D., 4,103,263, Cl. 333-30.00R.

Hughes, Donald R. Key bow cover. 4,102,166, Cl. 70-456.00R.

Hughes Tool Company: *See—*
Scales, Stanley R., 4,102,838, Cl. 260-22.0CB.

Huhtamaki Oy: *See—*
Karevaara, Juhani, 4,102,454, Cl. 206-514.000.

Hulse, Charles Orcutt, to United Technologies Corporation. Ceramic-metallic eutectic structural material. 4,103,063, Cl. 415-212.00R.

Hults, Harold W.; and Halbeck, Werner B., to Cutler-Hammer, Inc. Snap-action overcenter switch having an apexed plunger depressible in a rockable actuator block and operated by a toggle lever having a positive off cam. 4,103,127, Cl. 200-67.00G.

Humbrol Limited: *See—*
Luff, Stanley Herbert, 4,102,500, Cl. 239-345.000.

Humlicek, Larry D., to Minnesota Mining and Manufacturing Company. Pillowed web of blown microfibers. 4,103,058, Cl. 428-171.000.

Hunahashi, Susumu: *See—*
Baba, Takashi; Hunahashi, Susumu; and Kawabata, Toshihiko, 4,102,001, Cl. 15-104.10C.

Hundeshagen, Christian: *See—*
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.

Hunt, Gary H.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Hunt, Harold R.: *See—*
Vanderveen, John W.; and Hunt, Harold R., 4,102,967, Cl. 264-113.000.

Hunter, Ralph W., deceased; and McLaulin, Marcia Hunter, administrator. Amphibious vehicle. 4,102,292, Cl. 115-1.00R.

Huntington Alloys, Inc.: *See—*
Gothard, David Olen; and Strobel, Gary Rudolph, 4,102,678, Cl. 427-191.000.

Huntley, Christopher Ryland, to GTE Lenkurt Electric (Canada) Ltd. Low dissipation voltage regulator. 4,103,220, Cl. 323-19.000.

Hunzinger, Jean-Jacques, to U.S. Philips Corporation. Optical device for coupling optical fibers to each other and/or a light source. 4,102,559, Cl. 350-96.180.

Hurd, William A.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Hutchinson, Donald D. Liquid vat heating apparatus. 4,102,330, Cl. 126-374.000.

Hydraulics Unlimited Manufacturing Co.: *See—*
Heinze, Alvin L., 4,102,424, Cl. 180-24.020.

Hyman, Charles E.; and Setter, Alfred C., to Sperry Rand Corporation. Aircraft power and phase converter. 4,103,325, Cl. 363-148.000.

ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization: *See—*
Sasse, Wolfgang Herman Fritz; and Jackson, Mervyn Benjamin, 4,102,762, Cl. 204-159.220.

Ida Engineering, Inc.: *See—*
Ida, Noble N., 4,102,533, Cl. 273-73.00E.
Ida, Noble N., to Ida Engineering, Inc. Adjustable head racquet frame. 4,102,533, Cl. 273-73.00E.
Ide, Kimie: *See—*
Murata, Moriyasu; and Ide, Kimie, 4,102,825, Cl. 252-547.000.
Idei, Gijun, to Tokyo Shibaura Electric Co., Ltd. Voltage follower circuit. 4,103,248, Cl. 330-288.000.
Idemitsu Kosan Company, Ltd.: *See—*
Maehara, Junichiro, 4,102,959, Cl. 264-41.000.
Ihlen, Jacob, to Alfa Skofabrik A/S. Ski-boot. 4,102,063, Cl. 36-117.000.
Iida, Takahiko; and Arita, Yasunobu, to Mitsubishi Denki Kabushiki Kaisha. Pulse generator including a capacitor which is discharged through a thyristor. 4,103,258, Cl. 331-111.000.
Iida, Tetsuya: *See—*
Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, 4,102,983, Cl. 423-245.000.
Iimura, Seiji: *See—*
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,103,085, Cl. 544-27.000.
Iiyoshi, Shuichiro, to Yugen Kaisha Iiyoshi Seisakusho. Caster frame. 4,102,172, Cl. 72-254.000.
Iizuka, Nobuhiro; and Hatanaka, Yoshihiro, to Glory Kogyo Kabushiki Kaisha. Coin packaging system. 4,102,110, Cl. 53-59.00R.
Ikawa, Kazuo: *See—*
Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, 4,102,217, Cl. 74-492.000.
Ikeda, Tadashi: *See—*
Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, 4,102,743, Cl. 195-7.000.
Ikeda, Tanejiro: *See—*
Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, 4,102,021, Cl. 29-25.420.
Ikegami, Keisuke; and Hoshimi, Susumu, to Sony Corporation. Cylindrical core with toroidal windings at angularly spaced locations on the core. 4,103,197, Cl. 310-267.000.
Ikezawa, Tetsuro: *See—*
Kabayama, Takahiko; Ogata, Masaru; and Ikezawa, Tetsuro, 4,103,100, Cl. 13-20.000.
Ikuno, Yuzi; and Tanaka, Yutaka, to Olympus Optical Co., Ltd. Electric knife device. 4,102,341, Cl. 128-303.140.
Illers, Karl Heinz: *See—*
Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, 4,102,871, Cl. 528-324.000.
Imafuku, Shigehisa: *See—*
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.
Imamura, Yoichi, to Kabushiki Kaisha Suwa Seikosha. Power-on reset semiconductor integrated circuit. 4,103,187, Cl. 307-251.000.
Imk Industriservice AB: *See—*
Magnusson, Erik Borje; and Karlsson, Erik Inge Bertil, 4,102,230, Cl. 83-835.000.
Imperial Chemical Industries Limited: *See—*
Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, 4,103,023, Cl. 424-279.000.
Bentley, John; and Thompson, Morice William, 4,102,846, Cl. 260-31.20N.
Brackman, Derek Samuel, 4,102,726, Cl. 156-244.110.
Jennings, James Robert; and Hogan, Philip John, 4,102,915, Cl. 260-465.80D.
Raphael, Ralph Alexander, 4,102,896, Cl. 260-343.600.
Reade, Grahame Melvin; and Viney, Alan Charles, 4,102,301, Cl. 118-67.000.
Thomas, David Hamilton, 4,102,837, Cl. 260-22.0CB.
Imura, Shinichi; Saito, Mitsutaka; and Morishita, Nobuo, to Toyo Soda Manufacturing Co., Ltd. Process for carboxylation of ethylene-vinyl acetate copolymers or saponified copolymers. 4,102,946, Cl. 260-878.00R.
In Situ Technology, Inc.: *See—*
Terry, Ruel C., 4,102,397, Cl. 166-259.000.
Inaba, Shigeho: *See—*
Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
Inano, Toyojiro: *See—*
Katsumi, Yasuo; Matsuda, Shoei; and Inano, Toyojiro, 4,102,082, Cl. 51-101.00R.
Information Terminals Corporation: *See—*
Anglin, Noah L.; and Berry, Robert H., 4,102,516, Cl. 242-199.000.
Ing. A. Maurer S.A.: *See—*
Luthi, Fritz; and Bach, Guido, 4,102,625, Cl. 425-464.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Hsieh, Paul Y.; and Rogall, Eugene W., 4,103,043, Cl. 427-49.000.
Ingalls, Richard L., to H. B. Fleming, Inc. Method of and equipment for use in driving composite piles. 4,102,141, Cl. 61-53.500.
Innes, Robert A.: *See—*
Beuther, Harold; Innes, Robert A.; and Swift, Harold E., 4,102,914, Cl. 260-465.300.
Inouye, Shigeharu: *See—*
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
Inox Industria E. Comercio de Aco S/A: *See—*
Del Sarto, Franco, 4,102,505, Cl. 241-297.000.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,103,280, Cl. 340-12.00R.
Institut Textile de France: *See—*
Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.
Instrumentation Engineering, Inc.: *See—*
DeVito, Louis; and Esser, Albert H., 4,102,491, Cl. 235-302.000.
Intel Corporation: *See—*
Perlegos, George; and Salsbury, Phillip J., 4,103,189, Cl. 307-270.000.
Interlock Industries Limited: *See—*
Davis, Ronald Percival, 4,102,012, Cl. 16-179.000.
International Basic Economy Corporation: *See—*
Hertel, Douglas Leo; and Lee, Robert Wen, 4,103,074, Cl. 528-487.000.
International Business Machines Corporation: *See—*
Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, 4,103,066, Cl. 428-337.000.
Case, William John Philip, 4,103,314, Cl. 360-78.000.
Castellani, Eugene Evans; Powers, John Vincent; and Romankiw, Lubomyr Taras, 4,102,756, Cl. 204-43.00T.
Chang, Leroy Ligong; Esaki, Leo; and Sai-Halasz, George Anthony, 4,103,312, Cl. 357-16.000.
Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, 4,103,329, Cl. 364-200.000.
De La Moneda, Francisco H.; and Kotecha, Harish N., 4,102,733, Cl. 156-653.000.
DeBar, David E.; and De La Moneda, Francisco H., 4,102,714, Cl. 148-187.000.
Gomez, Richard Santiago; and Scray, Eugene James, Jr., 4,103,135, Cl. 200-185.000.
Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, 4,103,346, Cl. 365-216.000.
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
Miersch, Ekkehard Fritz; and Spampinato, Dominic Patrick, 4,103,342, Cl. 365-149.000.
Winters, Harold Franklin, 4,103,042, Cl. 427-38.000.
International Business Machines Incorporated: *See—*
Gindi, Abraham M.; and Lang, Donald John, 4,103,336, Cl. 364-900.000.
International Flavors & Fragrances Inc.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.
Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.
International Nickel Company, Inc., The: *See—*
Michels, Harold Thomas, 4,102,225, Cl. 75-124.000.
Tenbergen, Reichel A., 4,102,781, Cl. 209-166.000.
International Standard Electric Corporation: *See—*
Martens, Jean Victor, 4,103,247, Cl. 330-284.000.
International Telephone & Telegraph Corp.: *See—*
Fischer, Laurin G., 4,103,237, Cl. 325-132.000.
Inventing S.A.: *See—*
Wallsten, Hans Ivar, 4,102,299, Cl. 118-50.000.
Inverni Della Beffa S.p.A.: *See—*
Mustich, Giuseppe, 4,103,025, Cl. 424-305.000.
Invicta Plastics Limited: *See—*
Kindred, Michael, 4,102,535, Cl. 273-282.000.
IOG Industrie-Ofenbau GmbH: *See—*
Wilkening, Hermann; and Loges, Hans-Joachim, 4,102,170, Cl. 72-147.000.
Iowa State University Research Foundation, Inc.: *See—*
Wheelock, Thomas D., 4,102,989, Cl. 423-541.00R.
Irgens, Finn T. Internally cooled rotary combustion engine. 4,102,615, Cl. 418-86.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin process. 4,102,943, Cl. 260-850.000.
Isenson, Raymond S.: *See—*
Magardo, Robert F.; Ambrosini, Leonard R.; and Isenson, Raymond S., 4,102,241, Cl. 89-155.000.
Ishiai, Tamio: *See—*
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,102,158, Cl. 68-5.00E.
Ishii, Noriyuki: *See—*
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
Ishikawa, Michio: *See—*
Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, 4,103,253, Cl. 331-94.50G.
Ishikawa, Yoshikazu, to Nissan Motor Company, Ltd. Rotary piston internal combustion engine and rotor thereof. 4,102,616, Cl. 418-91.000.
Ishikawa, Youhei: *See—*
Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, 4,102,696, Cl. 106-73.200.
Itayama, Shinichi, to Teizo Sakai. Ventilating suction and exhaust fan device of sirocco type. 4,102,596, Cl. 415-101.000.

Itayama, Shinichi, to Teizo Sakai. Ventilating suction and exhaust fan device of plate type. 4,102,597, Cl. 415-101.000.
Ito, Fumio: *See—*
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, 4,103,307, Cl. 354-23.00D.
Ito, Kazuo, to Kabushiki Kaisha Daini Seikosha. Miniature tape cassettes. 4,102,514, Cl. 242-199.000.
Ito, Nobuo, to Robert Bosch GmbH. Rectifier assembly for vehicular alternator-rectifier. 4,103,193, Cl. 310-68.00D.
Ito, Tadashi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, 4,103,307, Cl. 354-23.00D.
Ivanyi, Geza: *See—*
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Iwama, Akio; and Mune, Isao, to Nitto Electric Industrial Co., Ltd. Hydrous gel and process for its preparation. 4,102,807, Cl. 252-316.000.
Iwamoto, Michinori; and Nomura, Toshiyuki, to Horiba, Ltd. Apparatus for the continuous measurement of the concentration of oil. 4,103,162, Cl. 250-343.000.
Iwanaga, Yukiya: *See—*
Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, 4,103,039, Cl. 426-607.000.
Iwase, Yoshiyuki: *See—*
Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, 4,102,834, Cl. 260-4.0AR.
J. G. Sylvester Associates, Inc.: *See—*
Sylvester, Bruce J.; and Sylvester, Roger P., 4,102,203, Cl. 73-620.000.
J. M. Voith GmbH: *See—*
Merkle, Theodor; and Meyer, Paul, 4,102,273, Cl. 104-34.000.
Jackson, Clarence E.; and Freeman, Albert A. Low hydrogen welding electrodes. 4,103,067, Cl. 428-387.000.
Jackson, Harold Wofford, to Bendix Corporation, The. Fast frequency hopping synthesizer. 4,103,250, Cl. 331-1.00A.
Jackson, Hiram Soloman, Jr., to S & C Electric Company. Sealing arrangement for high voltage fuse. 4,103,270, Cl. 337-178.000.
Jackson, Mervyn Benjamin: *See—*
Sasse, Wolfgang Herman Fritz; and Jackson, Mervyn Benjamin, 4,102,762, Cl. 204-159.220.
Jacobus, Nelson Mortimer, Jr., to Communications Satellite Corporation. Proportional warmup timer for power line outages using stored charge for power. 4,103,180, Cl. 307-141.000.
Jacques, Andre: *See—*
d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, 4,103,154, Cl. 250-227.000.
Jacques, James O.: *See—*
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
Jadatz, Harald B., to Slater Electric Co. Weatherproof receptacle cover and shield. 4,102,466, Cl. 220-3.800.
Jagers, Leopold. Circular saw blades. 4,102,231, Cl. 83-854.000.
James, Wallace D. Agitator for washing machines. 4,102,156, Cl. 68-4.000.
Janson, Richard W. Curtain suspension assembly. 4,102,007, Cl. 16-94.00R.
Janson, Richard W. Curtain suspension assembly. 4,102,008, Cl. 16-96.00R.
Jansz, Joost W., to Hollandsche Beton Groep NV. Submersible positioning and guiding apparatus for pile driving. 4,102,147, Cl. 61-53.500.
Janvier, Lucien: *See—*
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.
Japan Gasoline Co., Ltd.: *See—*
Sasaki, Takashi; and Saima, Michio, 4,102,980, Cl. 423-239.000.
Japan Spectroscopic Co., Ltd.: *See—*
Saito, Muneo; and Konishi, Hideki, 4,102,782, Cl. 210-31.00C.
Jaquay, Louis H., to Dravo Corporation. Method for recovering lead from battery mud. 4,102,676, Cl. 75-77.000.
Jarosz, John M.; and Swanson, Roy T., to S & C Electric Company. Auxiliary mechanism for imparting rotational energy to electrical components. 4,103,120, Cl. 200-48.00R.
Jarvenpaa, Viljo Juhana. Apparatus for contacting a gas with a liquid. 4,102,658, Cl. 55-230.000.
Jarvis, Barry Michael Frank, to Exhibition Showplace Services Limited. Stand construction system. 4,102,087, Cl. 52-9.000.
Jay, Melvin C., to Elgin-Macor, Inc. Sliding door locking system. 4,102,545, Cl. 292-57.000.
Jayson, Richard N.: *See—*
Calderazzo, Franklin James, 4,102,439, Cl. 188-24.000.
Jeavons, Philip Swingewood, to Wilmot-Breeden Limited. Pivot mounting of levers. 4,102,588, Cl. 403-245.000.
Jefferies, Patrick J.; and Crounse, Nathan N., to Sterling Drug Inc. Water-soluble quaternary ammonium non-heterocyclic azo dyestuffs. 4,103,092, Cl. 260-175.000.
Jeffery, Russell L.; and Cote, Lawrence V., to Cobe Laboratories, Inc. Bubble trap. 4,102,655, Cl. 55-201.000.
Jendrichowski, Klaus: *See—*
Wiendahl, Joachim; Jendrichowski, Klaus; and Sushradt, Wolfgang, 4,102,351, Cl. 134-129.000.
Jenkins, Albert Edward, to Perkins & Powell Limited. Door closer. 4,102,006, Cl. 16-51.000.
Jennie, Fred LeRoy, to Weatherby, Inc. Gas regulator for gas operated firearms. 4,102,243, Cl. 89-193.000.
Jennings, James Robert; and Hogan, Philip John, to Imperial Chemical Industries Limited. Dimerization process. 4,102,915, Cl. 260-465.80D.
Jensen, Victor: *See—*
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
Jerobee Industries, Inc.: *See—*
Weglin, Walter, 4,102,735, Cl. 156-661.000.
Jester, John P.: *See—*
Schnarr, Raymond H.; and Jester, John P., 4,102,005, Cl. 16-49.000.
Jiminez, Pedro, to Ateliers de Constructions Mecaniques Seailles et Tison. Method of and apparatus for folding a sheet to form pages of variable format. 4,102,531, Cl. 270-79.000.
Johann Groschl, Firma: *See—*
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., to Engineering Inventions Inc.; and Multisensors Inc. Cooking apparatus. 4,102,256, Cl. 99-372.000.
John Zink Company: *See—*
Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., 4,102,627, Cl. 431-16.000.
Johnson, Craig E.; Dendor, Paul F.; and Csanady, Elmer R., to United States of America, Navy. Method for making extruded, solventless, composite-modified double base propellant. 4,102,953, Cl. 264-3.00B.
Johnson, David C.: *See—*
Meacham, Thomas E., Jr.; and Johnson, David C., 4,102,645, Cl. 21-102.00R.
Johnson, Glenn W., Jr.; and Lindlau, Paul F., to Amerace Corporation. Method of making louvered connectors and contact elements thereof. 4,102,286, Cl. 113-119.000.
Johnson & Johnson: *See—*
Aberson, Gerhard M.; and Stulgate, Emily M., 4,103,062, Cl. 428-283.000.
Mesek, Frederick K.; and Repke, Virginia L., 4,102,340, Cl. 128-287.000.
Johnson, Lewis T.: *See—*
Carroll, James C.; and Johnson, Lewis T., 4,102,453, Cl. 206-507.000.
Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Process for separation and recovery of carbon monoxide. 4,102,802, Cl. 252-184.000.
Johnson, Michael R.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,102,894, Cl. 260-332.30R.
Johnson, Norman Walter, to Coates Brothers & Co., Ltd. Water-dispersible oleoresinous paint binders. 4,102,836, Cl. 260-22.0TN.
Johnson, Richard A.: *See—*
Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., 4,102,745, Cl. 195-31.00R.
Johnsson, Sven, to Pacfex Aktiebolag. Transport box. 4,102,485, Cl. 229-23.00R.
Johnston, Frederick Eric. Rock drilling apparatus and method. 4,102,413, Cl. 175-53.000.
Johnston, Richard: *See—*
Downing, Keith Stanley; and Johnston, Richard, 4,102,046, Cl. 30-346.530.
Johnston, Richard Paul: *See—*
Smith, James; and Johnston, Richard Paul, 4,102,603, Cl. 416-244.00A.
Jones, Germaine T., to Raymond Lee Organization, Inc., The, a part interest. Self-wringing map. 4,102,002, Cl. 15-119.00A.
Joppien, Hartmut, to Schering Aktiengesellschaft. Pesticidal synergistic mixture of a dioxathiepin and a formamidine. 4,103,007, Cl. 424-244.000.
Jordan, Heinrich; and Sindermann, Siegmar, to Holstein & Kappert Aktiengesellschaft. Filling member for a counterpressure filling machine. 4,102,365, Cl. 141-39.000.
Joy Manufacturing Company: *See—*
Bailey, Edward A.; and Ordway, James F., 4,102,414, Cl. 175-85.000.
Jung, Fritz: *See—*
Kwech, Ludwig; and Jung, Fritz, 4,102,700, Cl. 106-100.000.
Jung, Lothar. Method for manufacturing hollow and solid ingots. 4,102,663, Cl. 65-18.000.
Jung, Michel: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,103,089, Cl. 548-344.000.
Junger, Hans: *See—*
Weissenfels, Franz; and Junger, Hans, 4,102,832, Cl. 521-103.000.
K & B Innovations, Inc.: *See—*
Morris, Betty Jean, 4,102,456, Cl. 206-575.000.
K. Bratschi, Silent Gliss: *See—*
Bratschi, Konrad, 4,102,381, Cl. 160-168.00R.

K. & V. Sorensen Engineering Ltd.: *See*—
Sorensen, Keld Torben Schneider, 4,102,593, Cl. 408-130.000.
Kabayama, Takahiko; Ogata, Masaru; and Ikezawa, Tetsuro, to Kabushiki Kaisha Komatsu Seisakusho. Cell adapted for producing high temperatures and high pressures. 4,103,100, Cl. 13-20.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Hayamizu, Mamoru; and Tanigaki, Yasushi, 4,102,571, Cl. 356-1.000.
Ito, Kazuo, 4,102,514, Cl. 242-199.000.
Tabata, Junichi, 4,102,119, Cl. 58-23.00R.
Tanaka, Kojiro, 4,102,122, Cl. 58-58.000.
Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, 4,102,123, Cl. 58-140.00R.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, 4,102,743, Cl. 195-7.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kabayama, Takahiko; Ogata, Masaru; and Ikezawa, Tetsuro, 4,103,100, Cl. 13-20.000.
Kabushiki Kaisha Nippon Coinco: *See*—
Hihara, Sokichi; Horiuchi, Mikio; and Ohe, Takeshi, 4,102,348, Cl. 128-422.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Imamura, Yoichi, 4,103,187, Cl. 307-251.000.
Kawamura, Yoshikazu; and Eguchi, Hiroshi, 4,103,191, Cl. 310-49.00R.
Kachi, Atsuyuki: *See*—
Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Woychesin, Elias A.; and Legleu, Clovis P., III, 4,102,981, Cl. 423-240.000.
Kaiser, John J.: *See*—
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.
Kalart Victor Corporation: *See*—
Schwartz, Morris, 4,102,569, Cl. 353-120.000.
Kalk, Walter; Bien, Hans Samuel; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Process for the preparation of diaryl compounds. 4,102,924, Cl. 260-562.00P.
Kalvaitis, Arvydas J., to S & C Electric Company. Tamper-resistant enclosure for electrical equipment. 4,102,475, Cl. 220-366.000.
Kaman Sciences Corporation: *See*—
Church, Peter K.; and Phillips, Alan G., 4,102,085, Cl. 51-295.000.
Kambara, Ginjiro; Koike, Susumu; and Matsuda, Toshio, to Matsushita Electric Industrial Co., Ltd. Method for diffusing an impurity into a semiconductor body. 4,102,715, Cl. 148-188.000.
Kameno, Yoshito: *See*—
Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
Kamide, Noboru: *See*—
Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, 4,103,253, Cl. 331-94.50G.
Kamiya, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Structure of sealing split rim type wheels. 4,102,379, Cl. 152-405.000.
Kammerer, Archer W., Jr., to Bakerdrill Inc. Borehole drilling apparatus. 4,102,418, Cl. 175-324.000.
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, to Mitsui Petrochemical Industries, Ltd. Process for producing synthetic resin laminates. 4,102,720, Cl. 156-78.000.
Kaneko, Yoshiaki, to Sanki Denshi Kogyo Kabushiki Kaisha. Apparatus for preventing the occurrence of possible transient phenomena in an electric power transmission circuit. 4,103,316, Cl. 361-3.000.
Kangas, Timothy J., to Paccar Inc. Infinitely variable, controllably and/or automatically adjustable air deflector and method. 4,102,548, Cl. 296-1.00S.
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Oxepanes. 4,102,895, Cl. 260-340.600.
Kansas Stall Company, Inc.: *See*—
Cusick, Richard D.; and Wall, Larry W., 4,102,307, Cl. 119-16.000.
Kanyo, Erzsebet: *See*—
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
Kao Soap Co., Ltd.: *See*—
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
Majima, Kanji; Takei, Kensuke; and Tsutoo, Keiichi, 4,102,911, Cl. 260-458.00R.
Minegishi, Yutaka; and Arai, Haruhiko, 4,102,795, Cl. 252-8.900.
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,102,824, Cl. 252-545.000.
Murata, Moriyasu; and Ide, Kimie, 4,102,825, Cl. 252-547.000.
Karakis, Thomas G.; and Klotz, Clayton J., to Allen-Bradley Company. Switch housing with cable seal. 4,103,136, Cl. 200-302.000.
Karalashvili, Archil Levanovich: *See*—
Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich, 4,102,016, Cl. 19-159.00R.
Karch, John A.: *See*—
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.
Karevaara, Juhani, to Huhtamaki Oy. Conical disposable mug. 4,102,454, Cl. 206-514.000.
Karhu-Titan Oy: *See*—
Saaristo, Seppo, 4,102,061, Cl. 36-28.000.
Karlsson, Erik Inge Bertil: *See*—
Magnusson, Erik Borje; and Karlsson, Erik Inge Bertil, 4,102,230, Cl. 83-835.000.
Kasahara, Masaru: *See*—
Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya, 4,103,278, Cl. 340-1.00R.
Kashio, Toshio, to Casio Computer Co., Ltd. Data handling system involving memory-to-memory transfer. 4,103,334, Cl. 364-900.000.
Kashiwagi, Midori: *See*—
Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, 4,103,004, Cl. 424-177.000.
Kataoka, Setsuo. Method of breeding new varieties of the first filial generation plant. 4,102,079, Cl. 47-58.000.
Katchman, Arthur: *See*—
Cooper, Glenn Dale; and Katchman, Arthur, 4,102,850, Cl. 260-33.6AQ.
Kato, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal means in a rotary piston engine. 4,102,617, Cl. 418-142.000.
Kato, Taketoshi; Uchida, Masato; and Goto, Kenichi, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing a semiconductor device. 4,102,732, Cl. 156-645.000.
Katsube, Junki: *See*—
Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition for high frequencies. 4,102,696, Cl. 106-73.200.
Katsumi, Yasuo; Matsuda, Shoei; and Inano, Toyojiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Cam grinding apparatus with means to maintain the grinding speed constant. 4,102,082, Cl. 51-101.00R.
Kautz, Glenn E., to H. H. Robertson Company. Light transmitting building panel. 4,103,059, Cl. 428-178.000.
Kawabata, Toshihiko: *See*—
Baba, Takashi; Hunahashi, Susumu; and Kawabata, Toshihiko, 4,102,001, Cl. 15-104.10C.
Kawahara, Akira, to Ryusyo Industrial Co., Ltd. Clasping device. 4,102,018, Cl. 24-68.0CD.
Kawamura, Masaharu: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Kawamura, Takeo; Saiki, Noritsugu; Nakamura, Yoshitugu; and Tokashiki, Michiyuki, to Teijin Limited. Fire-retardant thermoplastic polyester resin compositions and method for imparting fire retardancy to polyester resins. 4,102,853, Cl. 260-40.00R.
Kawamura, Yoshikazu; and Eguchi, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Step motor. 4,103,191, Cl. 310-49.00R.
Kawana, Masashi: *See*—
Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.
Kawasaki Steel Corporation: *See*—
Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.
Kawata, Koichi: *See*—
Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, 4,102,021, Cl. 29-25.420.
Kay, Kenneth R.: *See*—
Wagner, Anthony S.; and Kay, Kenneth R., 4,102,075, Cl. 43-17.100.
Kearin, Martin John; Hiscutt, Robert; and Molineux, Peter, to Triplex Safety Glass Company Limited. Metal oxide coatings. 4,102,768, Cl. 204-192.00P.
Keller, Gustav; and Enssle, Gerhard. Manhole-pit lining and method of making and installing same. 4,102,088, Cl. 52-20.000.
Keller, Hans W., to Honeywell Inc. Method for batch fabricating semiconductor devices. 4,103,273, Cl. 338-2.000.
Kellner, Jackson M., to Smith International, Inc. Tandem eccentric roller stabilizer for earth boring apparatus. 4,102,552, Cl. 308-4.00A.
Kellogg Company: *See*—
Fulger, Charles V.; and Morfee, Thomas D., 4,103,035, Cl. 426-321.000.
Kelly, Donald V. Roller assembly for sliding doors and windows. 4,102,009, Cl. 16-100.000.
Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., to Ensign-Bickford Company. No-flash seismic cord. 4,102,428, Cl. 181-116.000.
Kelly, Walter B.: *See*—
Albright, Roy H.; and Kelly, Walter B., 4,103,122, Cl. 200-48.00P.
Kelsch, Joseph R., Jr. Temperature indicator. 4,102,200, Cl. 73-371.000.
Kennon, James L.; and Sandorf, Robert E., to Nordson Corporation. Resistor core cable. 4,103,276, Cl. 338-214.000.
Kenrich Petrochemicals, Inc.: *See*—
Monte, Salvatore J.; and Sugerman, Gerald, 4,102,862, Cl. 528-88.000.
Kermabon, Andre J., to Syminex. Method and apparatus for geophysical prospecting by radioactive diagraphy. 4,103,158, Cl. 250-269.000.
Kern, Evan J. Upright harpsichord action. 4,102,233, Cl. 84-258.000.
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, to DAVY POWERGAS GmbH. Ultrasonic atomizer for waste sulfuric acid and use thereof in acid cracking furnaces. 4,102,651, Cl. 23-277.00R.
Kernick, Andress; Ravas, Richard J.; and Geyer, Manvel A., to Westinghouse Electric Corp. Elevator system. 4,102,436, Cl. 187-29.00R.
Key, Michael David; and McNee, William Gordon, to Lever Brothers

Company. Manufacture of detergent compositions. 4,102,057, Cl. 34-10.000.

Kida, Takao; Mizuno, Hiroshi; and Okutsu, Masaru, to Ajinomoto Co. Inc. Herbicidal composition of amino acid higher alkyl ester type and method for controlling weeds. 4,102,672, Cl. 71-106.000.

Kilham, Peter, to Droll Yankees, Inc. Bird feeder. 4,102,308, Cl. 119-52.00R.

Kimball, Philip C.: *See—*
Head, Brian Arthur; and Kimball, Philip C., 4,102,736, Cl. 162-104.000.
Head, Brian Arthur; and Kimball, Philip C., 4,102,785, Cl. 210-65.000.

Kimball, Richard M.: *See—*
Roeder, Allan W.; Kimball, Richard M.; and Koschmeder, Richard F., 4,103,302, Cl. 343-9.000.

Kimble, Joe W.; Burchick, Duane A.; and Dotson, Edsel E., to Cerheronics Inc. Small arms laser training device. 4,102,059, Cl. 35-25.000.

Kimmon Electric Co., Ltd., The: *See—*
Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, 4,103,253, Cl. 331-94.50G.

Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst for purifying exhaust gases. 4,102,813, Cl. 252-430.000.

Kindred, Michael, to Invicta Plastics Limited. Board game. 4,102,535, Cl. 273-282.000.

King, John O., Jr. Method of forming a sealing sleeve joint construction. 4,102,030, Cl. 29-458.000.

Kinoshita, Katsuo: *See—*
Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.

Kiovsky, Joseph R., to Norton Company. Process for producing alumina catalyst carriers. 4,102,978, Cl. 423-626.000.

Kipp, Michael A.; and Walter, Richard T., to Container Corporation of America. Leakage resistance carton. 4,102,484, Cl. 229-16.00A.

Kirkham, Arthur J. Insulated tent. 4,102,352, Cl. 135-1.00R.

Kitano, Masahiko: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.

Kleber, Rolf: *See—*
Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, 4,102,793, Cl. 252-8.100.

Klein, Edmond: *See—*
Espaignol, Jacques; and Klein, Edmond, 4,102,037, Cl. 29-583.000.

Klein, Fred Godfrey. Jig and template apparatus and method for preparing a corner insert for a laminated plastic countertop. 4,102,374, Cl. 144-314.00B.

Klein, Howard P., to Texaco Development Corporation. Polyurethanes derived from novel novolak polyols. 4,102,828, Cl. 521-174.000.

Klein, Theodore Harold, to Bell Telephone Laboratories, Incorporated. Reinforced flexible printed wiring board. 4,103,102, Cl. 174-68.500.

Kleiner, Hans-Jerg: *See—*
Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, 4,102,793, Cl. 252-8.100.

Klima, Frank J. Rolling cutter drill bit with annular seal rings. 4,102,419, Cl. 175-371.000.

Klingest, Ole: *See—*
Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, 4,102,056, Cl. 34-10.000.

Klinikowski, James J.: *See—*
Hart, William A.; and Klinikowski, James J., 4,103,296, Cl. 340-309.100.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Haas, Helmut; and Baulig, Klaus-Peter, 4,102,589, Cl. 403-373.000.
Otte, Wilhelm, 4,102,791, Cl. 210-326.000.

Klockner-Werke AG: *See—*
Berstermann, Wilhelm, 4,102,573, Cl. 356-86.000.

Klose, Margret: *See—*
Porraz, Mauricio; and Klose, Margret, 4,102,137, Cl. 61-38.000.

Klose, Sigmar; and Hagen, Alexander, to Boehringer Mannheim GmbH. Process for enzymatic analysis. 4,102,742, Cl. 195-103.50R.

Klotz, Clayton J.: *See—*
Karakis, Thomas G.; and Klotz, Clayton J., 4,103,136, Cl. 200-302.000.

Klykon, Inc.: *See—*
Finger, Richard H.; and Michel, Thomas J., 4,103,202, Cl. 313-336.000.

Knight, Bernard William: *See—*
Goff, Paul Frederick; Knight, Bernard William; and Prentice, Kenneth James, 4,102,628, Cl. 431-43.000.

Knight, Houston W., to FMC Corporation. Dry-break coupler. 4,102,356, Cl. 137-614.060.

Knoll International, Inc.: *See—*
Morrison, Andrew I.; and Hannah, Bruce R., 4,102,549, Cl. 297-383.000.

Knoll, Oscar: *See—*
Altorfer, Hans; and Knoll, Oscar, 4,102,541, Cl. 280-11.1BT.

Knorr-Bremse GmbH: *See—*
Schelle, Axel; and Nell, Kuno, 4,102,459, Cl. 213-112.000.

Kobylecki, Ryszard J.: *See—*
Howarth, Barrie D.; and Kobylecki, Ryszard J., 4,102,933, Cl. 260-613.00D.

Koch, Louis; Dunn, Michael; and Lumpkin, Charles, to H. Kohnstamm & Company Inc. Incorporation of food grade dyestuffs into resinous compositions and articles prepared therefrom. 4,102,848, Cl. 260-31.600.

Koehler, Wolfgang: *See—*
Diehl, Walter; and Koehler, Wolfgang, 4,103,275, Cl. 338-25.000.

Koehn, William C.: *See—*
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.

Koh-I-Noor Rapidograph, Inc.: *See—*
Anderka, Gerold, 4,102,584, Cl. 401-259.000.

Kohayakawa, Yoshimi: *See—*
Matsumura, Isao; Kuwayama, Takeshi; and Kohayakawa, Yoshimi, 4,102,563, Cl. 351-7.000.

Kohl, Martin: *See—*
Brugger, Robert; Kohl, Martin; and Krause, Horst, 4,102,755, Cl. 204-43.00T.

Kohler, William H.; Mulder, James P.; and Meslink, Michael C., to Abex Corporation. Disc mounting ring. 4,102,443, Cl. 188-218.0XL.

Kohlert, Gerhard: *See—*
Wenderott, Berthold; and Kohlert, Gerhard, 4,102,709, Cl. 148-2.000.

Kohlhage, Ernst, to LuK Lamellen und Kupplungsbau GmbH. Flexible resilient brake band assembly. 4,102,441, Cl. 188-77.00W.

Koike, Susumu: *See—*
Kambara, Ginjiro; Koike, Susumu; and Matsuda, Toshio, 4,102,715, Cl. 148-188.000.

Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel cyclopropylmethylamine derivatives. 4,103,030, Cl. 424-330.000.

Kojima, Hajime: *See—*
Saito, Yutaka; Yamamoto, Youichi; and Kojima, Hajime, 4,103,196, Cl. 310-266.000.

Kojo, Dairoku. Flowerpot. 4,102,080, Cl. 47-67.000.

Kokoulin, Felix Georgievich: *See—*
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.

Kolb, Gustav: *See—*
Bardenheuer, Friedrich; and Kolb, Gustav, 4,102,197, Cl. 73-354.000.

Kolber, Steven. Calculator theft prevention device. 4,103,289, Cl. 340-164.00R.

Koleske, Joseph Victor: *See—*
Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, 4,102,942, Cl. 260-836.000.

Kolitz, Volker: *See—*
Stalherm, Dieter; and Kolitz, Volker, 4,102,751, Cl. 202-151.000.

Komada, Eiji: *See—*
Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, 4,102,962, Cl. 264-82.000.

Kon, Chiyohide: *See—*
Sugita, Kazuhiro; and Kon, Chiyohide, 4,103,232, Cl. 324-158.00F.

Kondo, Sadao; and Nakano, Hidehiko, to Takeda Chemical Industries, Ltd. Method of producing microcapsules and resulting product. 4,102,806, Cl. 252-316.000.

Kondo, Yasumitsu: *See—*
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.

Konishi, Hideki: *See—*
Saito, Muneo; and Konishi, Hideki, 4,102,782, Cl. 210-31.00C.

Konishiroku Photo Industry Co., Ltd.: *See—*
Ohta, Tatsuo, 4,102,306, Cl. 118-658.000.
Shimoda, Kazuho, 4,102,570, Cl. 355-16.000.

Konotsune, Shiro: *See—*
Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.

Koonz, Carl H.: *See—*
Strandine, Eldon J.; and Koonz, Carl H., 4,102,258, Cl. 99-532.000.

Koopmeiners, Linus J., to Gran-A-Stone Company, The. Fireplace room heater. 4,102,319, Cl. 126-121.000.

Koper, Janusz. Powder for continuous casting. 4,102,690, Cl. 106-38.280.

Koppers Company, Inc.: *See—*
Hartford, Winslow H., 4,103,000, Cl. 424-133.000.

Koritz, Bjorn R. Odor conditioner. 4,102,656, Cl. 55-210.000.

Korman, Richard Thomas. Hidden tiers. 4,102,086, Cl. 52-9.000.

Korner, Tassilo: *See—*
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.

Korsky, Vincent Viacheslav, to Northern Telecom Limited. Telephone line circuit with differential loop current sensing and compensation. 4,103,112, Cl. 179-18.0FA.

Kosaku, Itai, to Mitsubishi Denki Kabushiki Kaisha. Tank-type compressed-gas circuit-breaker having capacitance-supporting means. 4,103,128, Cl. 200-144.0AP.

Koschmeder, Richard F.: *See—*
Roeder, Allan W.; Kimball, Richard M.; and Koschmeder, Richard F., 4,103,302, Cl. 343-9.000.

Koser, Rolf, to Sidro GmbH & Co. Ludwig Moller. Method and apparatus for pipe bending. 4,102,169, Cl. 72-128.000.

Kotecha, Harish N.: *See*—
De La Moneda, Francisco H.; and Kotecha, Harisl. N., 4,102,733, Cl. 156-653.000.
Kountz, Kenneth John, to Borg-Warner Corporation. Control system for refrigeration apparatus. 4,102,150, Cl. 62-209.000.
Kovacs, Kalman: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Kovacs, Lajos: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Kovar, John L.: *See*—
Devarakonda, Vasant K.; and Kovar, John L., 4,102,180, Cl. 73-91.000.
Kowalyshyn, Stephen: *See*—
Thompson, John H.; Kowalyshyn, Stephen; and Nelkin, Arthur, 4,102,195, Cl. 73-340.000.
Koyama, Aiichiro: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.
Krachman, Howard Ellis, to Developmental Sciences, Inc. Non-shocking pin for fluorescent type tubes. 4,102,558, Cl. 339-144.00R.
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, to Kramer Trenton Company, by said Israel Kramer, Harold Kramer, Larry Board, Ram Kumar Chopra and William Micai. Hot gas defrost system with dual function liquid line. 4,102,151, Cl. 62-278.000.
Kramer, Harold: *See*—
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.
Kramer, Israel: *See*—
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.
Kramer Trenton Company: *See*—
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William (said Israel Kramer, Harold Kramer, Larry Board, Ram Kumar Chopra and William Micai assors. to), 4,102,151, Cl. 62-278.000.
Krammer, Kelly A. Articulated cultivator. 4,102,404, Cl. 172-310.000.
Krause, Horst: *See*—
Brugger, Robert; Kohl, Martin; and Krause, Horst, 4,102,755, Cl. 204-43.00T.
Krautkramer-Branson, Incorporated: *See*—
Pies, Wilfried; and Brandt, Reinhard, 4,102,205, Cl. 73-626.000.
Kreider, Benjamin A.; and Metalsky, William J., to Abar Corporation. Work support for vacuum electric furnaces. 4,102,637, Cl. 432-227.000.
Kress, Dieter; and Haberle, Friedrich, to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Floating reamer. 4,102,594, Cl. 408-186.000.
Kretz, Carl. Ultrasonic section plane examination and display. 4,102,204, Cl. 73-626.000.
Krick, John B., to Val Tech Inc. Motor protector providing phase failure and overload cutoff for three-phase variable voltage variable frequency motor. 4,103,317, Cl. 361-31.000.
Krimsky, Leonard C.; and Van Rietschoten, Henk, to Worldwide Converting Machinery, Inc. Turret for winders and unwinders. 4,102,511, Cl. 242-64.000.
Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, to B. F. Goodrich Company, The. Catalyst and process for the preparation of ethylene and vinyl chloride from ethane. 4,102,935, Cl. 260-656.00R.
Krongelb, Sol: *See*—
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
Kruger, Gunther, to Steele Chemicals Co. Ltd. 19,8-Lactone steroid derivatives and processes of preparation thereof. 4,102,883, Cl. 260-239.55R.
Kruger, Gunther, to Steele Chemicals Co. Ltd. 14 β-Hydroxy 3-deoxycardenolides. 4,102,884, Cl. 260-239.570.
Kuan, Tiong Ho; and Sommer, John George, to General Tire & Rubber Company, The. Compositions comprising EPDM, E/VA and poly-alpha-methylstyrene. 4,102,855, Cl. 260-42.330.
Kubitzek, Harry; Feltgen, Karlheinz; and Rosendahl, Friedrich-Karl, to Bayer Aktiengesellschaft. Process for the production of polyamide-6-filaments of the γ-modification. 4,102,965, Cl. 264-103.000.
Kubota, Hayato: *See*—
Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, 4,103,039, Cl. 426-607.000.
Kubota Ltd.: *See*—
Baba, Takashi; Hunahashi, Susumu; and Kawabata, Toshihiko, 4,102,001, Cl. 15-104.10C.
Ozaki, Tsutomu; and Enomoto, Kazuyoshi, 4,102,421, Cl. 177-185.000.
Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, 4,102,537, Cl. 296-102.000.
Uyama, Noboru; and Hara, Katsuaki, 4,102,420, Cl. 177-25.000.
Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,102,858, Cl. 260-45.80N.
Kuhle, Engelbert: *See*—
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.
Kuhn, Hans Heinrich: *See*—
Hauser, Peter Jacob; Hendrix, James Easton; and Kuhn, Hans Heinrich, 4,102,644, Cl. 8-164.000.
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, to Sumitomo Metal Industries, Ltd. Method of producing a tube of ultra-high strength steel having remarkably improved ductility and toughness. 4,102,711, Cl. 148-12.300.
Kurita Water Industries Limited: *See*—
Okada, Hiroo; Hirota, Moriyuki; and Uesugi, Masaaki, 4,102,786, Cl. 210-80.000.
Kuroda, Tadashi: *See*—
Suzuki, Yasoji; and Kuroda, Tadashi, 4,103,184, Cl. 307-225.00C.
Kuroiwa, Ryozo: *See*—
Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, 4,102,537, Cl. 296-102.000.
Kurosaki, Hideaki: *See*—
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.
Kuwada, Yutaka: *See*—
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 4,102,881, Cl. 260-239.0BD.
Kuwayama, Takeshi: *See*—
Matsumura, Isao; Kuwayama, Takeshi; and Kohayakawa, Yoshimi, 4,102,563, Cl. 351-7.000.
Kwech, Ludwig; and Jung, Fritz, to Perlmooser Zementwerke Aktiengesellschaft. Process for the production of a mixture to be utilized in the production of building materials and a device for carrying out the process. 4,102,700, Cl. 106-100.000.
Kydonieus, Agis F., to Herculite Protective Fabrics Corporation. Process for controlling cockroaches and other crawling insects. 4,102,991, Cl. 424-27.000.
L.A. Levanto Oy: *See*—
Arvela, Aukusti, 4,102,679, Cl. 75-226.000.
La Nationale S.A.: *See*—
Zellweger, Conrad; and Guenin, Andre, 4,102,633, Cl. 431-152.000.
Labaz: *See*—
Gubin, Jean; and Rosseels, Gilbert, 4,103,012, Cl. 424-263.000.
Laboratorios Landerlan, S. A.: *See*—
Acosta Mira, Jose E., 4,103,019, Cl. 424-274.000.
LaChapelle, Theodore J., Jr.: *See*—
Pizzarello, Frank A.; and LaChapelle, Theodore J., Jr., 4,103,144, Cl. 219-209.000.
Lacoste, Gerard: *See*—
Chevalier, Michel; Lucas, Jean-Claude; and Lacoste, Gerard, 4,103,218, Cl. 323-1.000.
Laethem, Robert Van: *See*—
Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.
La Forge, Louis H., Jr., to Tri-Century Industries, Inc. Intrusion alarm apparatus. 4,103,293, Cl. 340-514.000.
Lagarelli, Carmen J., to Speakman Company. Vandal-proof fixture handle. 4,101,989, Cl. 4-191.000.
Lagerstedt, John Arne, to Atlas Copco Aktiebolag. Rock drilling machine. 4,102,409, Cl. 173-50.000.
Lakhoua, Noureddine: *See*—
Poirier, Raymond; Hubert, Yves; and Lakhoua, Noureddine, 4,103,333, Cl. 364-824.000.
Lambda Physik GmbH & Co. KG: *See*—
Schmidt, Werner, 4,103,179, Cl. 307-88.300.
Lampe, Donald Ross: *See*—
Fagan, John Lee; White, Marvin Hart; and Lampe, Donald Ross, 4,103,344, Cl. 365-184.000.
Lampert, William B., III: *See*—
Simmons, Charles T.; and Lampert, William B., III, 4,102,653, Cl. 44-16.00R.
Landgraf, Robert A., to Emerson Electric Co. Two speed single phase induction motor. 4,103,213, Cl. 318-224.00A.
Lang, Donald John: *See*—
Gindi, Abraham M.; and Lang, Donald John, 4,103,336, Cl. 364-900.000.
Lang, Ernst: *See*—
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.
Lang, Walter: *See*—
Auinger, Herbert; Lang, Walter; and Mader, Manfred, 4,103,217, Cl. 322-28.000.
Langbein-Pfanhauser Werke AG: *See*—
Brugger, Robert; Kohl, Martin; and Krause, Horst, 4,102,755, Cl. 204-43.00T.
Lange, Frederick F.; and Singhal, Subhash C., to Westinghouse Electric Corp. Silicon nitride compositions in the Si_3N_4-Y_2O_3-SiO_2 system. 4,102,698, Cl. 106-65.000.
Lange, Hans: *See*—
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, 4,103,041, Cl. 427-2.000.
Lange, K. Robert, to Betz Laboratories, Inc. Removal of microbiological deposits. 4,102,707, Cl. 134-22.00R.

Langerbein, Bernhard: *See—*
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,102,138, Cl. 61-42.000.

Langheinrich, Dieter: *See—*
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.

Lapchenko, Alexandr Mikhailovich: *See—*
Mamvriisky, Alexandr Sergeevich; and Lapchenko, Alexandr Mikhailovich, 4,103,351, Cl. 366-30.000.

Lapornik, Edward F.; and Rife, Douglas D., to Acuity Systems, Incorporated. Back vertex annular aperture. 4,102,575, Cl. 356-125.000.

Laporte Industries, Limited: *See—*
Robinson, Michael; Mobbs, David Barry; and Talati, Kirit, 4,102,812, Cl. 252-421.000.

Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J. Device for the regulation of the air-fuel mixture in internal combustion engines. 4,102,313, Cl. 123-119.0EC.

Laprade, Xavier J.: *See—*
Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J., 4,102,313, Cl. 123-119.0EC.

LaRochelle, Ronald W., to General Electric Company. Method for making silarylenesiloxane-polydiorganosiloxane block polymers. 4,102,941, Cl. 260-825.000.

Larsen, Ole Arvid. Combination fuse, especially for fire protection installations. 4,103,272, Cl. 337-411.000.

Laskin, Charles L.; and Memmer, Timothy I., to SCM Corporation. Aqueous coil coating primer. 4,103,050, Cl. 427-379.000.

Laubie, Michel: *See—*
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 4,102,890, Cl. 260-307.00F.

Laurent, Henry: *See—*
Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,102,908, Cl. 260-397.400.

Laurent, Jean: *See—*
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,103,280, Cl. 340-12.00R.

Lawrence Brothers, Inc.: *See—*
Newlon, Robert L., 4,102,013, Cl. 16-189.000.

Lawson, Frank, to Monash University. Calcination of basic ferric sulphates. 4,102,951, Cl. 423-594.000.

Lazazzero, Esther. Handle assembly for a baby carriage. 4,102,010, Cl. 16-115.000.

Lear Siegler, Inc.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.

LeBlanc, William K.: *See—*
Shafer, Jon L.; and LeBlanc, William K., 4,102,128, Cl. 60-400.000.

LeBoeuf, Albert R.: *See—*
Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., 4,102,567, Cl. 351-160.000.

Lecolier, Serge L.: *See—*
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.

Lee, George, to Hitco. Underwater riser buoyancy. 4,102,142, Cl. 61-86.000.

Lee, Henry L., Jr., to Lee Pharmaceuticals. Dental restorative compositions and process of using them. 4,102,856, Cl. 260-42.530.

Lee, Maw-Huei, to B. F. Goodrich Company, The. Tire inflation monitoring system. 4,103,283, Cl. 340-58.000.

Lee Pharmaceuticals: *See—*
Lee, Henry L., Jr., 4,102,856, Cl. 260-42.530.

Lee, Robert Wen: *See—*
Hertel, Douglas Leo; and Lee, Robert Wen, 4,103,074, Cl. 528-487.000.

Lee, Ta-Jyh: *See—*
Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., 4,102,888, Cl. 260-294.80D.

Lee, Walter; and Litt, Kenneth C., to Pace Incorporated. Collapsible container. 4,102,557, Cl. 312-257.00R.

Leeds, Winthrop M., to Westinghouse Electric Corp. Resistor applications for high-power circuit breakers. 4,103,130, Cl. 200-148.00A.

Legleu, Clovis P., III: *See—*
Woychesin, Elias A.; and Legleu, Clovis P., III, 4,102,981, Cl. 423-240.000.

Lehl, Elvest L.; and Zumwalt, Glen W. High-speed transportation system. 4,102,272, Cl. 104-23.0FS.

Lehmann, Rolf, to Escher Wyss Limited. Controlled deflection roll. 4,102,025, Cl. 29-116.0AD.

Leibhard, Erich: *See—*
Herb, Armin; Leibhard, Erich; and Uhlig, Raimer, 4,102,587, Cl. 403-205.000.

Leifheit International Gunter Leifheit GMBH: *See—*
Liebscher, Johannes; and Friedrich, Rainer, 4,102,000, Cl. 15-41.00R.

Leisure Group, The: *See—*
De Gelder, Jacob; Hill, William Harvey; and Englhard, Ronald F., 4,102,501, Cl. 239-511.000.

Le Masters, Laurence G. Drum practice pad. 4,102,235, Cl. 84-411.00R.

Lenhard, Robert Herman: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,103,028, Cl. 424-315.000.

Leon, Luis: *See—*
Guarderas, Fernando V.; and Leon, Luis, 4,102,268, Cl. 101-399.000.

Leonard, Murray: *See—*
Howatt, Glenn N.; and Leonard, Murray, 4,103,264, Cl. 333-72.000.

Lesaicherre, Andre; and Linguenheld, Louis, to Rhone-Poulenc, S.A. Process for improving the adhesion of coatings made of photoresistant polymers to surfaces of inorganic oxides. 4,103,045, Cl. 427-82.000.

Leslie Co.: *See—*
Reilly, Francis X., 4,102,297, Cl. 116-142.0FP.

Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., to Signode Corporation. Method of dunnage bag inflation. 4,102,364, Cl. 141-4.000.

Le Tourneau, Gary M.: *See—*
Nack, Michael R.; and Le Tourneau, Gary M., 4,102,111, Cl. 53-182.00R.

Leupp, Alex M.: *See—*
McGreivy, Denis J.; Peterson, Henry T.; and Leupp, Alex M., 4,103,297, Cl. 340-324.00M.

Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Method and apparatus for making fibers from thermoplastic materials. 4,102,662, Cl. 65-5.000.

Lever Brothers Company: *See—*
Bodor, Janos; van Heteren, Jan; and Verhagen, Laurentius Adrianus Maria, 4,103,037, Cl. 426-575.000.
Key, Michael David; and McNee, William Gordon, 4,102,057, Cl. 34-10.000.

Levin, Robert E., to GTE Sylvania Incorporated. Phototherapy irradiation chamber. 4,103,175, Cl. 250-504.000.

Levine, Alexander M.; and Ramsey, Henry R., to Webster Spring Co. Inc. Spring assembly with reinforcement. 4,101,992, Cl. 5-260.000.

Levitt, Charlie Maurice; Chatterley, Samuel; and Flinn, Peter John Livsey. Cutting of materials by spark erosion. 4,103,137, Cl. 219-69.00W.

Levy, Fernand Jacques, to Avions Marcel Dassault-Breguet Aviation. Porous structure. 4,103,055, Cl. 428-113.000.

Lewallyn, Michael. System for forming sheet material into spiral rolls. 4,102,512, Cl. 242-66.000.

Lewis, Dartrey: *See—*
Sun, Jack Ji-Nong; and Lewis, Dartrey, 4,102,780, Cl. 209-39.000.

Lewis, Kemp S., to Williams, Danny R.; and McPhail, Kenneth D. Sundial. 4,102,054, Cl. 33-270.000.

Lewis, Roger N.: *See—*
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,102,815, Cl. 252-426.000.

Lewis, Sheldon N.; and Haggard, Richard A., to Rohm and Haas Company. Novel methacrylic polymers having condensation-cross-linkable functionality. 4,103,093, Cl. 560-205.000.

Li, Choh Hao, to Hoffmann-La Roche Inc. Novel-enkephalin analogs. 4,103,005, Cl. 424-177.000.

Libbey-Owens-Ford Company: *See—*
Thomas, Lazarus D., 4,102,706, Cl. 134-3.000.

Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., to Carrier Corporation. Apparatus for loading refuse into containers. 4,102,262, Cl. 100-53.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
Lindner, Kurt; and Wiesbeck, Werner, 4,103,259, Cl. 331-117.00D.

Liebscher, Johannes; and Friedrich, Rainer, to Leifheit International Gunter Leifheit GMBH. Carpet sweeper. 4,102,000, Cl. 15-41.00R.

Liedke, Carl F., to O. F. Mossberg & Sons, Inc. Autoloading gas-operated firearm. 4,102,242, Cl. 89-191.00R.

Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,102,486, Cl. 229-37.00R.

Limberg, Allen LeRoy, to RCA Corporation. Switchable current amplifier. 4,103,246, Cl. 330-278.000.

Lincoln Park Engineering, Inc.: *See—*
Mackinder, Harold C., 4,102,592, Cl. 408-46.000.

Lindau Chemicals, Inc.: *See—*
Robinson, Robert Earl; and Ernst, John Alan, 4,102,667, Cl. 71-3.000.

Lindblad, Stig Martin. Safety belt device. 4,102,020, Cl. 24-164.000.

Linde Aktiengesellschaft: *See—*
Hildebrandt, Peter; Veranneman, Georg; and Schottroff, Werner, 4,102,386, Cl. 164-259.000.
Meinass, Helmut, 4,102,503, Cl. 241-18.000.

Linden, Lars Kalle; and Persson, Kjell Stellan, to Telefonaktiebolaget L M Ericsson. Arrangement for the performing seizure statistics for a device belonging to a group of devices. 4,103,149, Cl. 235-92.0TE.

Lindlau, Paul F.: *See—*
Johnson, Glenn W., Jr.; and Lindlau, Paul F., 4,102,286, Cl. 113-119.000.

Lindner, Kurt; and Wiesbeck, Werner, to Licentia Patent-Verwaltungs-GmbH. Semiconductor oscillator for very short waves. 4,103,259, Cl. 331-117.00D.

Lindsey, Marvin H.: *See—*
Taboada, John; and Lindsey, Marvin H., 4,102,610, Cl. 417-417.000.

Lingle, Harrison Church: *See—*
Pearson, Kenneth Carlton; and Lingle, Harrison Church, 4,102,586, Cl. 403-188.000.

Linguenheld, Louis: *See—*
Lesaicherre, Andre; and Linguenheld, Louis, 4,103,045, Cl. 427-82.000.

Litt, Kenneth C.: *See—*
Lee, Walter; and Litt, Kenneth C., 4,102,557, Cl. 312-257.00R.

Little Giant Products, Inc.: *See—*
Schuster, Frank C., 4,102,464, Cl. 214-750.000.

Litton Systems, Inc.: *See*—
Burnham, Fred E.; and Clark, William H., 4,103,304, Cl. 343-113.00R.
Chaffee, Edwin George, 4,103,207, Cl. 315-3.500.
Lloyd, Geoffrey John: *See*—
Lloyd, William; Lloyd, Geoffrey John; and Dawson, David, 4,103,285, Cl. 340-65.000.
Lloyd, Norman E.: *See*—
Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., 4,102,745, Cl. 195-31.00R.
Lloyd, William; Lloyd, Geoffrey John; and Dawson, David. Vehicle anti-theft alarm system. 4,103,285, Cl. 340-65.000.
Locke, Frederic J.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.
Loctite Corporation: *See*—
Repetto, Stephen, 4,103,081, Cl. 526-323.100.
Loctite (Ireland) Limited: *See*—
Gleave, Edward Roger, 4,102,945, Cl. 260-879.000.
Loeffler, Herbert H., to Ciba-Geigy Corporation. Squeeze bottle dispenser with air check valve on cover. 4,102,476, Cl. 222-209.000.
Loewe-Opta GmbH: *See*—
Frank, Egon, 4,103,313, Cl. 360-70.000.
Loges, Hans-Joachim: *See*—
Wilkening, Hermann; and Loges, Hans-Joachim, 4,102,170, Cl. 72-147.000.
Lonovics, Janos: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Lord, David E.; Petrini, Richard R.; and Carter, Gary W., to United States of America, Energy. Examination of interior surfaces using glow-discharge illumination. 4,102,582, Cl. 356-241.000.
Lore, Nicola; and Di Pietro, Charles. Switch guard assembly. 4,102,471, Cl. 220-242.000.
Low, Judit, nee Kaloczy: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Low, Miklos: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Lowe, Warren, to Chevron Research Company. Lubricating oil antioxidant additive composition. 4,102,796, Cl. 252-47.500.
Lowerre, Ralph T., to Hanlon & Wilson Company. Rail bond. 4,102,497, Cl. 238-14.800.
Lucas, Jean-Claude: *See*—
Chevalier, Michel; Lucas, Jean-Claude; and Lacoste, Gerard, 4,103,218, Cl. 323-1.000.
Lucas, Roland T., to St. Luke's Hospital Research Foundation, Inc. Business reply form. 4,102,489, Cl. 229-73.000.
Luck, Russell M.; and Gainer, Gordon C., to Westinghouse Electric Corp. Alumina-thickened cycloaliphatic epoxy materials for use in atmospheres of arced sulfur hexafluoride and articles thereof. 4,102,851, Cl. 260-37.0EP.
Ludvigson, Birger. Pile driving device. 4,102,408, Cl. 173-2.000.
Luff, Stanley Herbert, to Humbrol Limited. Apparatus for spraying liquids. 4,102,500, Cl. 239-345.000.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, to Beecham Group Limited. Antibacterial compounds. 4,102,901, Cl. 260-345.80R.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, to Beecham Group Limited. Intermediates for the preparation of antibacterial compounds. 4,102,904, Cl. 260-345.70R.
LuK Lamellen und Kupplungsbau GmbH: *See*—
Kohlhage, Ernst, 4,102,441, Cl. 188-77.00W.
Luke, George Michael: *See*—
Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, 4,102,885, Cl. 544-283.000.
Lumpkin, Charles: *See*—
Koch, Louis; Dunn, Michael; and Lumpkin, Charles, 4,102,848, Cl. 260-31.600.
Lumpkin, Robert E.: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; and Lumpkin, Robert E., 4,102,773, Cl. 208-8.000.
Luthi, Fritz; and Bach, Guido, to Ing. A. Maurer S.A. Spinneret holder. 4,102,625, Cl. 425-464.000.
Lynch, Conrad Linden: *See*—
Tobias, Michael Allan; and Lynch, Conrad Linden, 4,102,869, Cl. 427-178.000.
Lynn, Alexander L.: *See*—
Torossian, Kevork A.; and Lynn, Alexander L., 4,103,195, Cl. 310-259.000.
Maass, Gunther: *See*—
Thom, Karl-Friedrich; Maass, Gunther; and Beck, Manfred, 4,102,940, Cl. 260-824.00R.
MacGregor, David C. Cardiovascular prosthetic devices and implants with porous systems. 4,101,984, Cl. 3-1.500.
Machinefabriek Geurtsen Deventer, B.V.: *See*—
Geurtsen, Alfonsus Antonius, 4,102,787, Cl. 210-104.000.
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Process for coating slides. 4,103,041, Cl. 427-2.000.
Mackinder, Harold C., to Lincoln Park Engineering, Inc. Multiple spindle inclined drilling machine. 4,102,592, Cl. 408-46.000.
MacKinnon, Alan G., to Foundation Equipment Corporation, The. Bottom brace for crane. 4,102,094, Cl. 52-116.000.
Macko, William John: *See*—
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
Mader, Manfred: *See*—
Auinger, Herbert; Lang, Walter; and Mader, Manfred, 4,103,217, Cl. 322-28.000.
Maeda, Yoshio; Matsumoto, Koichi; and Fukuda, Kenji, to Hitachi, Ltd. Monochromator combining a plurality of light dispersing elements. 4,102,576, Cl. 356-101.000.
Maeding, Dale G., to Hughes Aircraft Company. CCD Multiplexer. 4,103,109, Cl. 179-15.00A.
Maehara, Junichiro, to Idemitsu Kosan Company, Ltd. Process for preparing film by wet method. 4,102,959, Cl. 264-41.000.
Maes, Richard J., to Caterpillar Tractor Co. Control apparatus. 4,102,129, Cl. 60-403.000.
Magardo, Robert F.; Ambrosini, Leonard R.; and Isenson, Raymond S., to United States of America, Army. High-rate-of-fire rifle mechanism or dual cyclic rate mechanism. 4,102,241, Cl. 89-155.000.
Magistro, Angelo Joseph, to B. F. Goodrich Company, The. Catalyst and process for the preparation of ethylene and vinyl chloride from ethane. 4,102,936, Cl. 260-656.00R.
Magistro, Angelo Joseph: *See*—
Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, 4,102,935, Cl. 260-656.00R.
Magneville, Pierre: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,103,280, Cl. 340-12.00R.
Magnusson, Erik Borje; and Karlsson, Erik Inge Bertil, to Imk Industriservice AB. Sound-deadening device for rotary saw blades. 4,102,230, Cl. 83-835.000.
Mahler, Friedrich: *See*—
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 4,102,651, Cl. 23-277.00R.
Mahon, Douglas K.: *See*—
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
Maier, William. Outlet box connector and combination. 4,103,101, Cl. 174-65.00R.
Maillot, Philippe: *See*—
d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, 4,103,154, Cl. 250-227.000.
Majima, Kanji; Takei, Kensuke; and Tsutoo, Keiichi, to Kao Soap Co., Ltd. Sulfonating or sulfating method. 4,102,911, Cl. 260-458.00R.
Maki, Hidehiko: *See*—
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
Makoto, Suzuki: *See*—
Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, 4,103,224, Cl. 324-58.50C.
Malarkey, John Victor: *See*—
Currie, Matthew Porter, 4,102,104, Cl. 52-494.000.
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, to Science-Union et Cie, Societe Francaise de Recherche Medicale. 2-Amino oxazolines and process for making the same. 4,102,890, Cl. 260-307.00F.
Mammino, Joseph: *See*—
Goffe, William L.; and Mammino, Joseph, 4,102,682, Cl. 96-1.50R.
Mamvriisky, Alexandr Sergeevich; and Lapchenko, Alexandr Mikhailovich. Apparatus for controlling the density of a plugging fluid. 4,103,351, Cl. 366-30.000.
Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, to Fuji Oil Company, Limited. Method for producing improved shea fat. 4,103,039, Cl. 426-607.000.
Mandel, Alan F., to Westinghouse Electric Corp. Elevator system. 4,102,437, Cl. 187-29.00R.
Manelis, Georgy Borisovich: *See*—
Usvyatsov, Aidan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Mannesmann Aktiengesellschaft: *See*—
Bardenheuer, Friedrich; and Kolb, Gustav, 4,102,197, Cl. 73-354.000.
Mansei Kogyo Kabushiki Kaisha: *See*—
Goto, Kenjiro, 4,102,631, Cl. 431-253.000.
MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,102,594, Cl. 408-186.000.
Marcmann, Emil. Breeching insulation panels and method of construction. 4,102,103, Cl. 52-406.000.
Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, to Ciba-Geigy AG. Device for sampling fluid. 4,102,368, Cl. 141-250.000.

Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Hot water reservoir. 4,102,134, Cl. 61-1.00F.

Mariko, Hatamura: *See—*
Toshiyasu, Ishimaru; Minoru, Hatanaka; Mariko, Hatamura; and Hazime, Nitta, 4,103,008, Cl. 424-246.000.

Marino, Joseph. Hoop and selectively disengageable trundling apparatus. 4,102,077, Cl. 46-220.000.

Marker, Leon F.: *See—*
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,102,971, Cl. 264-255.000.

Markusch, Peter: *See—*
Scholl, Hans-Joachim; Markusch, Peter; and Dieterich, Dieter, 4,102,699, Cl. 106-84.000.

Marmet, Melvin L., to Rockwell International Corporation. Output address decoder with gating logic for increased speed and less chip area. 4,103,349, Cl. 365-231.000.

Marotta Scientific Controls, Inc.: *See—*
Petry, Henry Alfred; and deVersterre, William I., 4,102,171, Cl. 72-245.000.

Marquardt, Lloyd B., Jr., to Northwestern Public Service Company. Grounding device. 4,103,123, Cl. 200-48.00R.

Marrero, Louis. Modular electrical switch/outlet assembly. 4,103,125, Cl. 200-51.00R.

Marscher, William D.: *See—*
Fahim, Magdi M.; and Marscher, William D., 4,102,315, Cl. 123-124.00B.

Marsden, Howard A.; and Haak, Willard J., to Caterpillar Tractor Co. Front wheel drive system for a vehicle. 4,102,425, Cl. 180-66.00F.

Marshall, Robert Moore; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Polyester filamentary yarns. 4,103,068, Cl. 428-395.000.

Martens, Jean Victor, to International Standard Electric Corporation. Variable gain amplifiers. 4,103,247, Cl. 330-284.000.

Martignoni, Pasquale; Murfree, James A., Jr.; Chew, William M.; and Ayers, Orval E., to United States of America, Army. Cyano compounds as fuels for HF or DF lasers. 4,102,988, Cl. 423-483.000.

Martin, Eugene G.; and Risser, Dale M., to Victor F. Weaver, Inc. Modification assembly to a machine for processing the backs of poultry. 4,102,014, Cl. 17-11.000.

Martin, Frederick Raymond Patrick, to C.I. Hayes Inc. Headlamp tilting mechanism in a motor vehicle. 4,102,712, Cl. 362-71.000.

Martin, Herbert U., to Raymond Lee Organization, Inc., The, a part interest. Action toy. 4,102,076, Cl. 46-220.000.

Martin, James W.; and Hardwick, John R., to Butler Manufacturing Company. Knock-down starting platform for a roof seaming machine. 4,102,285, Cl. 113-54.00R.

Martin, Jay Robert, to Union Carbide Corporation. Separation of H_2, CO, and CH_4. 4,102,659, Cl. 62-17.000.

Martin Marietta Corporation: *See—*
Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., 4,102,270, Cl. 102-49.500.

Martz, Lyle F., to Westinghouse Electric Corp. Protective system for pneumatically operated devices. 4,102,248, Cl. 91-42.000.

Martzloff, Francois D.: *See—*
Burgess, James F.; Girard, Roland T.; Martzloff, Francois D.; and Neugebauer, Constantine A., 4,103,274, Cl. 338-21.000.

Maruma Jyusharyo Kabushiki Kaisha: *See—*
Moriki, Y., 4,103,138, Cl. 219-76.110.

Maruyama, Isamu: *See—*
Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.

Maruyama, Takashi, to Nippon Kogaku K.K. Device for correcting positional deviation and reduced scale of photograph. 4,102,048, Cl. 33-1.00A.

Masaki, Katsumi; Hirayama, Kazuhiro; and Sato, Yasushi, to Canon Kabushiki Kaisha. Light scanning device. 4,103,156, Cl. 250-236.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Schwab, Gunter, 4,102,600, Cl. 416-91.000.

Massa, Donald P.: *See—*
Massa, Frank, 4,103,309, Cl. 354-25.000.

Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust. Automatic camera focusing means. 4,103,309, Cl. 354-25.000.

Mastropole, Anthony. Fireplace heat exchanger. 4,102,320, Cl. 126-121.000.

Masuda, Takao: *See—*
Sashihara, Kenji; and Masuda, Takao, 4,102,312, Cl. 96-114.100.

Masuda, Toru: *See—*
Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.

Masui, Akira: *See—*
Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, 4,102,675, Cl. 75-24.000.

Masur, Klaus: *See—*
Reiff, Karl; and Masur, Klaus, 4,102,051, Cl. 33-174.00P.

Matheson, J. Neal; and Richardson, David L., to Procter & Gamble Company, The. Low and non-phosphate detergent compositions. 4,102,823, Cl. 252-533.000.

Mathison, Donald W., to Product Design & Engineering Inc. Device for forming an annular raised rib on a tubular member. 4,102,623, Cl. 425-393.000.

Matner, Martin: *See—*
Schwinum, Ernst; Hornig, Heinz; and Matner, Martin, 4,102,844, Cl. 260-29.70T.

Matsuda, Shoei: *See—*
Katsumi, Yasuo; Matsuda, Shoei; and Inano, Toyojiro, 4,102,082, Cl. 51-101.00R.

Matsuda, Shoji: *See—*
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.

Matsuda, Toshio: *See—*
Kambara, Ginjiro; Koike, Susumu; and Matsuda, Toshio, 4,102,715, Cl. 148-188.000.

Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, to Showa Denko K.K.; and Misawa Homes Institute of Research and Development. Process for manufacturing concrete articles of improved initial strength and long-term strength. 4,102,962, Cl. 264-82.000.

Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Device for measuring light incident on an image forming optical system. 4,103,153, Cl. 250-227.000.

Matsumoto, Koichi: *See—*
Maeda, Yoshio; Matsumoto, Koichi; and Fukuda, Kenji, 4,102,576, Cl. 356-101.000.

Matsumoto, Toshiyuki: *See—*
Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, 4,102,537, Cl. 296-102.000.

Matsumura, Isao; Kuwayama, Takeshi; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Eye fundus camera free from undesired reflected and diffused light beams. 4,102,563, Cl. 351-7.000.

Matsumura, Susumu: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kambara, Ginjiro; Koike, Susumu; and Matsuda, Toshio, 4,102,715, Cl. 148-188.000.
Miyagi, Kiyoshi, 4,102,568, Cl. 353-28.000.
Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, 4,102,021, Cl. 29-25.420.
Shigeta, Junnosuke, 4,103,242, Cl. 328-35.000.

Matsushita Electric Works, Ltd.: *See—*
Saito, Yutaka; Yamamoto, Youichi; and Kojima, Hajime, 4,103,196, Cl. 310-266.000.

Matsuura, Eiichi: *See—*
Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, 4,102,123, Cl. 58-140.00R.

Matthews, Richard E.; and Bolton, Theodore S., to Carrier Corporation. Air conditioning apparatus and method of assembling same. 4,102,148, Cl. 62-77.000.

Matulich, Dan S.; and Saylor, B. Franklin, to Garrett Corporation, The. Auto ignition temperature control system. 4,102,387, Cl. 165-1.000.

Max Planck Gesellschaft zur Forderung der Wissenschaften e. V.: *See—*
Danielmeyer, Hans-Gunter; and Hartmann, Werner, 4,103,173, Cl. 250-483.000.

Maxson Corporation, The: *See—*
Hackbarth, Richard W.; and Puariea, Douglas A., 4,102,212, Cl. 74-89.220.

Mayer, Jean Paul: *See—*
Fournier, Pierre Louis Edmond; and Mayer, Jean Paul, 4,102,704, Cl. 106-288.00Q.

Mayes, Gary Wayne: *See—*
Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, 4,103,329, Cl. 364-200.000.

Maytag Company, The: *See—*
Goodlaxson, John D., 4,102,544, Cl. 285-8.000.

Mazelsky, Robert; Fey, Maurice G.; and Harvey, Francis J., to Westinghouse Electric Corp. Arc heater method for the production of single crystal silicon. 4,102,767, Cl. 204-164.000.

MBI, Inc.: *See—*
Schiffman, Murray M., 4,102,734, Cl. 156-659.000.

McAlear, James H.; and Wehrung, John M., to Dios, Inc. Microdevice substrate and method for making micropattern devices. 4,103,064, Cl. 428-333.000.

McAlear, James H.; and Wehrung, John M., to Dios, Inc. Microsubstrates and method for making micropattern devices. 4,103,073, Cl. 428-474.000.

McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Method of preparing hepatitis B core antigen. 4,102,996, Cl. 424-89.000.

McCabe, Frank A.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.

McCarty, William M.: *See—*
Noland, Joseph R.; and McCarty, William M., 4,102,391, Cl. 165-29.000.

McCauley, Jerry L.: *See—*
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., 4,102,031, Cl. 29-464.000.

McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., to Andros, Incorporated. Infrared source for use in an infrared gas detector. 4,103,174, Cl. 250-493.000.

McCord Corporation: *See—*
Salisbury, Wayne C., 4,102,833, Cl. 521-159.000.

McCoy, Carleton J.; and Schwartz, Robert D., to Exxon Research & Engineering Co. Two phase fermentation. 4,102,744, Cl. 195-28.00R.

McDonald, Jack: *See—*
Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, 4,102,765, Cl. 204-164.000.
McDonnell Douglas Corporation: *See—*
Green, Samuel I., 4,103,157, Cl. 250-239.000.
McGinnis, Edgar L.: *See—*
Carr, Norman L.; and McGinnis, Edgar L., 4,102,774, Cl. 208-8.000.
McGovern, Andrew: *See—*
Pirre, Frank A., Jr.; and McGovern, Andrew, 4,102,542, Cl. 280-207.000.
McGovern, Andrew J.: *See—*
Pirre, Frank A., Jr.; and McGovern, Andrew, 4,102,542, Cl. 280-207.000.
McGreivy, Denis J.; Peterson, Henry T.; and Leupp, Alex M., to Hughes Aircraft Company. Light-insensitive matrix addressed liquid crystal display system. 4,103,297, Cl. 340-324.00M.
McGuire, John. Jar opening apparatus. 4,102,226, Cl. 81-3.330.
McLaulin, Marcia Hunter, administrator: *See—*
Hunter, Ralph W., deceased; and McLaulin, Marcia Hunter, administrator, 4,102,292, Cl. 115-1.00R.
McManama, Gerald P., to Wyatt Engineers, Inc. Furnace hogged fuel disperser using modulated airflow. 4,102,278, Cl. 110-105.000.
McNee, William Gordon: *See—*
Key, Michael David; and McNee, William Gordon, 4,102,057, Cl. 34-10.000.
McPhail, Kenneth D.: *See—*
Lewis, Kemp S., 4,102,054, Cl. 33-270.000.
Meacham, Thomas E., Jr.; and Johnson, David C., to Refreshment Machinery Incorporated. Sterilization apparatus. 4,102,645, Cl. 21-102.00R.
Meewezen, Willem Douwe, to U.S. Philips Corporation. Compressor for both speech and carrier signals. 4,103,239, Cl. 325-144.000.
Megasystems, Inc.: *See—*
Tsipouras, Panayiotis J., 4,102,199, Cl. 73-362.0AR.
Meguro, Kanji: *See—*
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 4,102,881, Cl. 260-239.0BD.
Mehta, Arun Kumar, to Combustion Engineering, Inc. Centrifugal gas scrubber. 4,102,657, Cl. 55-222.000.
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, to Burroughs Wellcome Co. Sulfide compounds as antidepressants. 4,103,020, Cl. 424-274.000.
Meiji Seika Kaisha, Ltd.: *See—*
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
Meinass, Helmut, to Linde Aktiengesellschaft. Method of and apparatus for the low-temperature milling of materials. 4,102,503, Cl. 241-18.000.
Memmer, Timothy I.: *See—*
Laskin, Charles L.; and Memmer, Timothy I., 4,103,050, Cl. 427-379.000.
Meningand, Paul Albert: *See—*
Bernard, Jean-Paul; and Meningand, Paul Albert, 4,102,518, Cl. 244-110.00C.
Mentor Corporation: *See—*
Conway, Christopher J.; and Glover, Eugene G., 4,102,344, Cl. 128-419.00E.
Menzel, Alvin Lewis: *See—*
Stover, David Emmert; and Menzel, Alvin Lewis, 4,102,153, Cl. 64-28.00R.
Mercik, Henry J., Jr.; and Goetsch, Henry E., to United Technologies Corporation. Gas in coolant diagnostics for internal combustion engine. 4,102,178, Cl. 73-49.700.
Merck & Co., Inc.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,102,889, Cl. 260-296.00R.
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,102,882, Cl. 260-239.100.
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,102,996, Cl. 424-89.000.
Nutt, Ruth F., 4,102,877, Cl. 260-112.50R.
Putter, Irving; and Cole, Lucille J., 4,102,997, Cl. 424-115.000.
Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., 4,102,888, Cl. 260-294.80D.
Merkle, Theodor; and Meyer, Paul, to J. M. Voith GmbH. Apparatus for positioning battery-operated road vehicles at battery replacement stations. 4,102,273, Cl. 104-34.000.
Merrell Toraude et Compagnie: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,103,089, Cl. 548-344.000.
Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Disposable article with particulate hydrophilic polymer in an absorbent bed. 4,102,340, Cl. 128-287.000.
Meslink, Michael C.: *See—*
Kohler, William H.; Mulder, James P.; and Meslink, Michael C., 4,102,443, Cl. 188-218.0XL.
Metal Box Limited: *See—*
Brookes, Frederick D.; and Franek, Jozef T., 4,102,168, Cl. 72-117.000.
Metal Improvement Company, Inc.: *See—*
Fuchs, Henry O., 4,102,176, Cl. 73-12.000.
Metallurgie Hoboken-Overpelt: *See—*
Hiemeleers, Jozef; De Schepper, Achille; and Van Peteghem, Antoine, 4,102,976, Cl. 423-87.000.
Metalsky, William J.: *See—*
Kreider, Benjamin A.; and Metalsky, William J., 4,102,637, Cl. 432-227.000.
Metcalf, Brian Walter; and Jung, Michel, to Merrell Toraude et Compagnie. α-Acetylene and α-vinyl derivatives of amino acids. 4,103,089, Cl. 548-344.000.
Metzeler Schaum GmbH: *See—*
Bokelmann, Horst, 4,102,619, Cl. 425-89.000.
Meyer, Paul: *See—*
Merkle, Theodor; and Meyer, Paul, 4,102,273, Cl. 104-34.000.
Meyers, George Leroy, to American Can Company. Cartons for ice cream and the like. 4,102,457, Cl. 206-611.000.
Micai, William: *See—*
Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.
Michael, Henry L. Portable device for the accurate measurement of eye movements both in light and obscurity. 4,102,564, Cl. 351-7.000.
Michel, Thomas J.: *See—*
Finger, Richard H.; and Michel, Thomas J., 4,103,202, Cl. 313-336.000.
Michels, Harold Thomas, to International Nickel Company, Inc., The. Low chromium oxidation resistant austenitic stainless steel. 4,102,225, Cl. 75-124.000.
Miersch, Ekkehard Fritz; and Spampinato, Dominic Patrick, to International Business Machines Corporation. Two-device memory cell with single floating capacitor. 4,103,342, Cl. 365-149.000.
Mikulecky, Larry Gene. Foot propelled water vehicle. 4,101,996, Cl. 9-1.300.
Milants, Lodewijk Luciaan, to U.S. Philips Corporation. Tape cassette. 4,102,515, Cl. 242-199.000.
Milkes, Paul, to American Communication Systems, Inc. Memory tone dialer. 4,103,115, Cl. 179-90.00B.
Miller, Alan Leonard; and Petzold, Werner Paul, to Borg-Warner Corporation. Transmission control system. 4,102,222, Cl. 74-866.000.
Miller, Arthur, to RCA Corporation. Optical coupler. 4,102,560, Cl. 350-96.190.
Miller, Clarence L., Jr.: *See—*
Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, 4,102,713, Cl. 148-113.000.
Miller, Galer J.: *See—*
Clarke, John W.; and Miller, Galer J., 4,102,451, Cl. 206-219.000.
Miller, Gerald W., to Clopay Corporation. Window shade. 4,102,383, Cl. 160-263.000.
Miller, Gerald W., to Clopay Corporation. Window shade. 4,102,385, Cl. 160-263.000.
Miller, Gerald W.: *See—*
Gossling, Robert C.; and Miller, Gerald W., 4,102,384, Cl. 160-263.000.
Miller, Harold N.: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,102,798, Cl. 252-51.50A.
Miller, James Clayton, to Sargent & Greenleaf, Inc. Padlock having guided wedges for resisting destructive wedge attack. 4,102,162, Cl. 70-52.000.
Miller, William J.: *See—*
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,102,996, Cl. 424-89.000.
Milliken Research Corporation: *See—*
Farmer, Larry B., 4,103,051, Cl. 427-394.000.
Hauser, Peter Jacob; Hendrix, James Easton; and Kuhn, Hans Heinrich, 4,102,644, Cl. 8-164.000.
Milner, Ronald E.: *See—*
Van Jepmond, Howard K.; and Milner, Ronald E., 4,102,532, Cl. 273-1.00E.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-tetramethyl-4-piperidyl thiocarboxylates and aminocarboxylates and synthetic resin compositions containing the same. 4,102,858, Cl. 260-45.80N.
Minami, Shinsaku; and Takase, Yoshiyuki, to Dainippon Pharmaceutical Co., Ltd. Novel penicillin compounds and process for preparation thereof. 4,103,011, Cl. 424-251.000.
Minegishi, Yutaka; and Arai, Haruhiko, to Kao Soap Co., Ltd. Softener composition for fabrics or hair. 4,102,795, Cl. 252-8.900.
Minnesota Mining and Manufacturing Company: *See—*
Baratto, Eugene L.; and Dupre, Eugene J., 4,103,056, Cl. 428-142.000.
Bergh, Eugene H., 4,102,045, Cl. 30-287.000.
Bingham, Wallace Karl; and Bailey, Terry R., 4,103,060, Cl. 428-241.000.
Carey, Patrick H., Jr., 4,102,721, Cl. 156-79.000.
Clunis, Kenneth, 4,102,536, Cl. 274-23.00R.
Fayling, Richard E., 4,103,340, Cl. 365-97.000.
Freeman, Charles R.; and Sauer, Charlotte I., 4,102,835, Cl. 260-5.000.
Groves, James D.; and D'Zuro, Deborah Sue Anne, 4,102,716, Cl. 156-48.000.
Harper, James H.; and Smith, Linda S., 4,102,562, Cl. 350-105.000.
Humlicek, Larry D., 4,103,058, Cl. 428-171.000.
Trine, John A.; and Braun, David L., 4,102,201, Cl. 73-421.50R.
Minoru, Hatanaka: *See—*
Toshiyasu, Ishimaru; Minoru, Hatanaka; Mariko, Hatamura; and Hazime, Nitta, 4,103,008, Cl. 424-246.000.
Mirviss, Stanley B.: *See—*
Giolito, Silvio L.; and Mirviss, Stanley B., 4,103,096, Cl. 568-783.000.

Misaki, Akira: *See—*
Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, 4,102,743, Cl. 195-7.000.

Misawa Homes Institute of Research and Development: *See—*
Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, 4,102,962, Cl. 264-82.000.

Mishima, Hitoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup cartridge with moving magnet armature. 4,103,116, Cl. 179-100.41M.

Mitscher, Lester Allen; Clark, George Winfred, III; and Bokelman, Gordon Herman, to Ohio State University Research Foundation, The. Method for the preparation of prostaglandin intermediates from a mold metabolite. 4,103,091, Cl. 560-106.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Iida, Takahiko; and Arita, Yasunobu, 4,103,258, Cl. 331-111.000.
Kosaku, Itai, 4,103,128, Cl. 200-144.0AP.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Katsumi, Yasuo; Matsuda, Shoei; and Inano, Toyojiro, 4,102,082, Cl. 51-101.00R.

Mitsubishi Shoji Kaisha, Ltd.: *See—*
Fujishima, Daishiro; and Fujishima, Shinichiro, 4,102,803, Cl. 252-188.000.

Mitsui, Akio: *See—*
Sugiyama, Masatoshi; Sawaguchi, Hirosi; and Mitsui, Akio, 4,102,688, Cl. 96-139.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, 4,102,834, Cl. 260-4.0AR.

Miwa, Takao: *See—*
Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, 4,102,944, Cl. 260-861.000.

Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for introducing secondary air into an exhaust system of an internal combustion engine. 4,102,126, Cl. 60-276.000.

Miyagi, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Apparatus for indicating mounting positions of components. 4,102,568, Cl. 353-28.000.

Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, to Nippon Kokan Kabushiki Kaisha. Method of treating molten slags in steel making process. 4,102,675, Cl. 75-24.000.

Mize, Erbie Gail: *See—*
Brock, James Donald; and Mize, Erbie Gail, 4,103,350, Cl. 366-22.000.

Mizser, Geza: *See—*
Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, 4,102,181, Cl. 73-119.00A.

Mizuno, Hiroshi: *See—*
Kida, Takao; Mizuno, Hiroshi; and Okutsu, Masaru, 4,102,672, Cl. 71-106.000.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.

Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, to Kao Soap Co., Ltd. Non-aqueous detergent composition. 4,102,824, Cl. 252-545.000.

Mizzoni, Mary S.; and Reade, Richard F., to Corning Glass Works. Cathodoluminescent and photoluminescent glasses. 4,102,805, Cl. 252-301.40F.

Mobbs, David Barry: *See—*
Robinson, Michael; Mobbs, David Barry; and Talati, Kirit, 4,102,812, Cl. 252-421.000.

Mobil Oil Corporation: *See—*
Tobias, Michael Allan; and Lynch, Conrad Linden, 4,102,869, Cl. 427-178.000.

Modra, Theodor Victor; and Growden, Norman Wills. Press. 4,102,109, Cl. 53-24.000.

Mohn, Heinrich: *See—*
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.

Molineux, Peter: *See—*
Kearin, Martin John; Hiscutt, Robert; and Molineux, Peter, 4,102,768, Cl. 204-192.00P.

Moll, Norman G.: *See—*
Quarderer, George J.; and Moll, Norman G., 4,102,775, Cl. 208-10.000.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,102,731, Cl. 156-540.000.

Monash University: *See—*
Lawson, Frank, 4,102,951, Cl. 423-594.000.

Moneghan, Edward, to Pennwalt Corporation. Apparatus for molding rigid structures from dry friction material. 4,102,620, Cl. 425-147.000.

Monnet, Andre: *See—*
Duperray, Gilbert; Monnet, Andre; and Tournut, Claude, 4,102,966, Cl. 264-112.000.

Monsanto Company: *See—*
Crutchfield, Marvin M.; and Upton, Charles J., 4,102,903, Cl. 260-345.70R.
Deex, Oliver D.; and Weiss, Virgil W., 4,102,864, Cl. 528-173.000.
Genetti, Ralph A.; and Trivette, Chester D., Jr., 4,102,868, Cl. 260-858.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.
Price, Jerry L., 4,102,922, Cl. 260-532.000.

Monte, Salvatore J.; and Sugerman, Gerald, to Kenrich Petrochemicals, Inc. Application of cumylphenol and derivatives thereof in plastic compositions. 4,102,862, Cl. 528-88.000.

Moore, Robert L.: *See—*
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,102,256, Cl. 99-372.000.

Moreau, Jean Michel, to Thomson-CSF. Monolithic integrated transistor and protective circuit therefor. 4,103,181, Cl. 361-86.000.

Moreno, Roland, to Societe Internationale pour l'Innovation. Systems for storing and transferring data. 4,102,493, Cl. 235-419.000.

Morfee, Thomas D.: *See—*
Fulger, Charles V.; and Morfee, Thomas D., 4,103,035, Cl. 426-321.000.

Morgan, George W.: *See—*
Berry, Holland James; and Morgan, George W., 4,102,288, Cl. 114-41.000.

Mori, Kanau: *See—*
Watanabe, Seizaburo; Hattori, Eiji; and Mori, Kanau, 4,102,829, Cl. 521-81.000.

Moriarty, William L.; and Zobbi, Robert G., to American Chemical and Refining Company Incorporated. Electroplating test cell. 4,102,770, Cl. 204-195.00R.

Moriki, Y., to Maruma Jyusharyo Kabushiki Kaisha. Apparatus for build-up welding with cooling of a sealed and lubricated track link. 4,103,138, Cl. 219-76.110.

Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, to Mitsui Petrochemical Industries, Ltd. Hydrocarbon resins and process for preparing same. 4,102,834, Cl. 260-4.0AR.

Morinaga, Mistuyoshi, to Trio Kabushiki Kaisha. Pick-up cartridge. 4,103,117, Cl. 179-100.41Z.

Morishita, Nobuo: *See—*
Imura, Shinichi; Saito, Mitsutaka; and Morishita, Nobuo, 4,102,946, Cl. 260-878.00R.

Morris, Betty Jean, to K & B Innovations, Inc. Kit for three-dimensional plastic objects. 4,102,456, Cl. 206-575.000.

Morrison, Andrew I.; and Hannah, Bruce R., to Knoll International, Inc. Apparatus for adjusting the back support of a chair. 4,102,549, Cl. 297-383.000.

Morrow, Darrell R.; and Schuler, Michael. Disposable container. 4,102,488, Cl. 229-55.000.

Morrow, Edwin M. Plant container. 4,102,081, Cl. 47-67.000.

Morrow, William C.: *See—*
Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., 4,102,428, Cl. 181-116.000.

Morton, George Ira, to RCA Corporation. Complementary-symmetry amplifier. 4,103,188, Cl. 307-251.000.

Morton-Norwich Products, Inc.: *See—*
Gustin, Grant M., 4,102,814, Cl. 252-408.000.

Morton, Wendell J., to Procter & Gamble Company, The. Process and apparatus for forming a paper web having improved bulk and absorptive capacity. 4,102,737, Cl. 162-113.000.

Mosby, Frederick A., to General Electric Company. Cementless base incandescent lamp. 4,103,201, Cl. 313-318.000.

Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., to Diamond Shamrock Corporation. Antiinflammatory imidazothiazoles and thiazolopyrimidines. 4,103,016, Cl. 424-270.000.

Moskowitz, Seymour. Fluid pumping device. 4,102,605, Cl. 417-98.000.

Moss, Colin Roy, to Hawker Siddeley Dynamics Limited. Optical scanning equipment. 4,103,160, Cl. 250-334.000.

Mosse, Richard Wolfgang, to Corrugated Products GmbH. Method of making a laminar hollow body of angular cross-section and apparatus for performing the method. 4,102,725, Cl. 156-200.000.

Motorola, Inc.: *See—*
Beutler, Robert Russel, 4,103,190, Cl. 307-362.000.
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.
Nicolini, John Dominic; and Willard, David Frank, 4,103,286, Cl. 340-146.200.
Ollenbach, Ernest C., 4,102,481, Cl. 228-6.00R.

Moynihan, Daniel J.: *See—*
Campbell, John A. L.; and Moynihan, Daniel J., 4,102,550, Cl. 299-11.000.

MTD Products Inc.: *See—*
Plamper, Gerhard R., 4,102,219, Cl. 74-502.000.

Muchisky, Thomas Peter. Massage unit. 4,102,334, Cl. 128-36.000.

Mulaskey, Bernard F., to Chevron Research Company. Hydrocarbon hydroconversion catalyst and the method for its preparation. 4,102,822, Cl. 252-465.000.

Mulder, James P.: *See—*
Kohler, William H.; Mulder, James P.; and Meslink, Michael C., 4,102,443, Cl. 188-218.0XL.

Muller, David. Panty hose garment and method of manufacture thereof. 4,101,982, Cl. 2-409.000.

Muller, Helmut: *See—*
Hofmann, Peter; Muller, Helmut; and Rody, Jean, 4,102,870, Cl. 528-73.000.

Multisensors Inc.: *See—*
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,102,256, Cl. 99-372.000.

Mune, Isao: *See—*
Iwama, Akio; and Mune, Isao, 4,102,807, Cl. 252-316.000.

Munter, Ernst August, to Northern Telecom Limited. Circuit and

method for digitally measuring signal levels of PCM encoded signals. 4,103,108, Cl. 179-15.0BF.
Munz, Erich. Supporting element for supporting mounts in a sound and shock insulating manner. 4,102,522, Cl. 248-24.000.
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, to Nippon Shinyaku Co., Ltd. Benzoguanamine derivatives. 4,103,009, Cl. 424-249.000.
Murakami, Hiroyashu: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Murata Manufacturing Co., Ltd.: *See*—
Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, 4,102,696, Cl. 106-73.200.
Murata, Moriyasu; and Ide, Kimie, to Kao Soap Co., Ltd. Liquid light-duty detergent composition. 4,102,825, Cl. 252-547.000.
Murfree, James A., Jr.: *See*—
Martignoni, Pasquale; Murfree, James A., Jr.; Chew, William M.; and Ayers, Orval E., 4,102,988, Cl. 423-483.000.
Murphy, Alan Pearce: *See*—
Zaki, Wahib Nassif; and Murphy, Alan Pearce, 4,103,047, Cl. 427-242.000.
Mushrush, George W.; and Schlemmer, Thomas. Vibratory hopper-fed, flail-type pulverizer. 4,102,504, Cl. 241-186.00R.
Mustich, Giuseppe, to Inverni Della Beffa S.p.A. Novel terpenes. 4,103,025, Cl. 424-305.000.
Myers, John W.; and Harris, Jesse R., to Phillips Petroleum Company. Olefin disproportionation over silica-rare earth metal oxide catalysts. 4,102,939, Cl. 260-683.00D.
Nabisco, Inc.: *See*—
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.
Nack, Michael R.; and Le Tourneau, Gary M., to FMC Corporation. Wrapping machine. 4,102,111, Cl. 53-182.00R.
Nadelson, Jeffrey, to Sandoz, Inc. Substituted hydroxy pyridones. 4,103,013, Cl. 424-263.000.
Nagano, Masashi; and Sonoi, Koya, to Shimano Industrial Company Limited. Multi-speed freewheel for a bicycle. 4,102,215, Cl. 74-243.0DR.
Nagano, Masashi, to Shimano Industrial Company Limited. Driving chain for bicycles. 4,102,216, Cl. 74-245.00R.
Nagano, Tetsuro: *See*—
Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.
Nagase, Toshiro, to Tokico Ltd. Door closer. 4,102,004, Cl. 16-49.000.
Nagase, Tsuneyuki: *See*—
Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,102,842, Cl. 260-29.6PT.
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, to Bristol-Myers Company. 7-(Syn-α-alkoxy-iminofurylacetamido-3-(2-carboxyalkyl-2,3-dihydri-s-triazolo[4,3-b]pyridazin-3-on-6-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,103,085, Cl. 544-27.000.
Najork, Jack, to Reach Electronics, Inc. RF amplifier and antenna. 4,103,241, Cl. 325-373.000.
Naka, Mitsuru; and Sakamoto, Masao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fastening device for tiltable steering mechanisms. 4,102,218, Cl. 74-493.000.
Nakama, Hiroyuki: *See*—
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.
Nakamoto, Soichi: *See*—
Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, 4,103,307, Cl. 354-23.00D.
Nakamura, Masahiro; Tsuda, Tetsuaki; and Amakata, Hajime, to Sumitomo Metal Industries, Ltd. Apparatus for continuously electroplating on only a single surface of running metal strip. 4,102,772, Cl. 204-206.000.
Nakamura, Tadashi: *See*—
Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, 4,102,537, Cl. 296-102.000.
Nakamura, Yoshitugu: *See*—
Kawamura, Takeo; Saiki, Noritsugu; Nakamura, Yoshitugu; and Tokashiki, Michiyuki, 4,102,853, Cl. 260-40.00R.
Nakano, Hidehiko: *See*—
Kondo, Sadao; and Nakano, Hidehiko, 4,102,806, Cl. 252-316.000.
Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, to Matsushita Electric Industrial Co., Ltd. Method for making capacitors with plated terminals. 4,102,021, Cl. 29-25.420.
Nalco Chemical Company: *See*—
Pessimisis, George N., 4,102,821, Cl. 252-463.000.
Natale, Michele. Self-regulating fluid pressure and temperature valve and assembly. 4,102,354, Cl. 137-98.000.
Natale, Rocco J.: *See*—
Shonnard, John R.; and Natale, Rocco J., 4,102,317, Cl. 126-25.00B.
National Gypsum Company: *See*—
Summers, John J.; and Willis, Larry G., 4,103,052, Cl. 428-38.000.
National Research Development Corporation: *See*—
Parker, Robert Sydney Richard, 4,102,338, Cl. 128-90.000.
National Semiconductor Corporation: *See*—
Albarran, Jose F.; and Hamade, Adib R., 4,103,186, Cl. 307-251.000.
Natsugari, Hideaki: *See*—
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 4,102,881, Cl. 260-239.0BD.
Naumov, Sergei Nikolaevich: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Naydan, Bob Nicholas; and Brand, Arnold Joseph, to Singer Company, The. Torque repeater self-driver. 4,103,215, Cl. 318-654.000.
Neblung, Werner H.; and Petrich, Gerhard O. Railing system. 4,102,529, Cl. 256-70.000.
Nederman, Bill Peter Philip: *See*—
Stern, Leif E., 4,102,083, Cl. 51-170.00R.
Neeff, Rutger: *See*—
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,102,906, Cl. 260-382.000.
Nelkin, Arthur: *See*—
Thompson, John H.; Kowalyshyn, Stephen; and Nelkin, Arthur, 4,102,195, Cl. 73-340.000.
Nell, Kuno: *See*—
Schelle, Axel; and Nell, Kuno, 4,102,459, Cl. 213-112.000.
Nelson, Arvid L., to Gardner-Denver Company. Profile cutter. 4,102,583, Cl. 407-25.000.
Nelson, Norman A., to Upjohn Company, The. 3-(1'-Silyloxy-2'-hydroxyethyl)-4-hydroxy-6-oxohexanoic acid γ lactone derivatives. 4,102,899, Cl. 260-343.600.
Nelson, Norman A., to Upjohn Company, The. 3-(1'-Silyloxy-3'-hydroxyethyl)-4-hydroxy-6-silyloxyhexanoic acid γ lactone derivatives. 4,102,900, Cl. 260-343.600.
Nemcek, Donald Stephen, Sr., to Cole-Parmer Instrument Company. Electrometric apparatus. 4,103,231, Cl. 324-123.00R.
Nepela, Daniel Andrew: *See*—
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
Netherton, Oliver E. Solar heating assembly. 4,102,324, Cl. 126-270.000.
Neugebauer, Constantine A.: *See*—
Burgess, James F.; Girard, Roland T.; Martzloff, Francois D.; and Neugebauer, Constantine A., 4,103,274, Cl. 338-21.000.
Neuhaus, Ludwig: *See*—
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.
Neustadt, Bernard R.; and Zampaglione, Nicola, to Schering Corporation. 2-[4-(Polyhalo-2-hydroxy-2-propyl)anilino]-2-oxazolin-4-ones and thiazolin-4-ones corresponding thereto. 4,103,018, Cl. 424-272.000.
Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, to Institut Textile de France; and Agence Nationale de Valorisation de la Recherche. Method for manufacturing crimped textile elements by fibrillation of films. 4,102,969, Cl. 264-147.000.
Newall Engineering Company, Ltd., The: *See*—
Phillips, James Hugh; David, Curt Ludwig; and Rogers, Michael James, 4,103,222, Cl. 324-207.000.
Newlon, Robert L., to Lawrence Brothers, Inc. Tamper-proof spring hinge. 4,102,013, Cl. 16-189.000.
Ng, Walter C.; and Wilgus, Conrad A. Regulatable flush valve for tank flush toilets. 4,101,986, Cl. 4-325.000.
NGK Insulators, Ltd.: *See*—
Hizikata, Tosihiko, 4,103,103, Cl. 174-140.00C.
Nicholson, Edward W.: *See*—
Cahn, Robert P.; and Nicholson, Edward W., 4,102,741, Cl. 176-87.000.
Nicolini, John Dominic; and Willard, David Frank, to Motorola, Inc. Digital binary group call circuitry arrangement. 4,103,286, Cl. 340-146.200.
Nielsen, Carl Philip; and Wood, Noel Sydney Davidson, to Harnee Pty. Ltd. Glass panes, and buildings and the like including glass panes. 4,102,101, Cl. 52-263.000.
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, to General Electric Company. Method and apparatus for monitoring the output of a neutron detector. 4,103,166, Cl. 250-391.000.
Niida, Taro: *See*—
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
Nikku Industry Co., Ltd.: *See*—
Taniguchi, Toru, 4,103,046, Cl. 427-113.000.
Nippon Carbon Co., Ltd.: *See*—
Taniguchi, Toru, 4,103,046, Cl. 427-113.000.
Nippon Electric Co., Ltd.: *See*—
Tan, Yoichi, 4,103,244, Cl. 329-122.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Mishima, Hitoshi, 4,103,116, Cl. 179-100.41M.
Yokoyama, Kenji, 4,103,245, Cl. 330-265.000.
Nippon Kogaku K.K.: *See*—
Maruyama, Takashi, 4,102,048, Cl. 33-1.00A.
Nippon Kokan Kabushiki Kaisha: *See*—
Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, 4,102,675, Cl. 75-24.000.
Nippon Paint Company: *See*—
Takimoto, Yasuyuki; and Yoshikawa, Toshikazu, 4,103,057, Cl. 428-156.000.

Nippon Shinyaku Co., Ltd.: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.

Nippon Steel Corporation: *See—*
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.

Nishi, Tetu: *See—*
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.

Nishida, Koichi: *See—*
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.

Nishida, Takao; and Tonoike, Kiyoshi, to Amchem Products, Inc. Process for applying resinous coating to metal surface. 4,103,049, Cl. 427-341.000.

Nishiguchi, Masaru: *See—*
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.

Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, to Nippon Steel Corporation. Process for producing formed coke for metallurgical use. 4,102,750, Cl. 201-6.000.

Nishii, Tasaku: *See—*
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.

Nishimura, Shinichi: *See—*
Takizawa, Shiro; and Nishimura, Shinichi, 4,102,565, Cl. 351-14.000.

Nishio, Masahiro: *See—*
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.

Nissan Motor Company, Ltd.: *See—*
Ishikawa, Yoshikazu, 4,102,616, Cl. 418-91.000.
Tanaka, Shigenori; and Tojo, Akio, 4,102,361, Cl. 139-435.000.
Tojo, Akio, 4,102,362, Cl. 139-435.000.
Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, 4,102,217, Cl. 74-492.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Iwama, Akio; and Mune, Isao, 4,102,807, Cl. 252-316.000.

Nocom, A. L.: *See—*
Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., 4,102,364, Cl. 141-4.000.

Nogami, Tomoyuki; and Ohta, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control valve for vehicle braking systems. 4,102,551, Cl. 303-24.00A.

Noguchi, Haruo; and Reinhard, Max, to Colortronic Reinhard & Co., KG; and Colortronic Co., Ltd. Process and device for continuous metering and mixing. 4,103,357, Cl. 366-152.000.

Noland, Joseph R.; and McCarty, William M., to General Electric Company. Heat pump frost control system. 4,102,391, Cl. 165-29.000.

Nollen, Willi: *See—*
Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, 4,102,913, Cl. 260-465.100.

Nomura, Toshiyuki: *See—*
Iwamoto, Michinori; and Nomura, Toshiyuki, 4,103,162, Cl. 250-343.000.

Nordson Corporation: *See—*
Kennon, James L.; and Sandorf, Robert E., 4,103,276, Cl. 338-214.000.

North, Roger W. Molded curved drums and molds therefor. 4,102,236, Cl. 84-411.00R.

Northern Telecom Limited: *See—*
Finlay, John Reid, 4,103,356, Cl. 363-22.000.
Korsky, Vincent Viacheslav, 4,103,112, Cl. 179-18.0FA.
Munter, Ernst August, 4,103,108, Cl. 179-15.0BF.

Northrop Corporation: *See—*
Bahraman, Ali; and Crandall, Walter E., 4,103,111, Cl. 179-15.00A.

Northwestern Public Service Company: *See—*
Marquardt, Lloyd B., Jr., 4,103,123, Cl. 200-48.00R.

Norton Company: *See—*
Kiovsky, Joseph R., 4,102,978, Cl. 423-626.000.

Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, to University of Hawaii. Cardiotonic agent. 4,103,004, Cl. 424-177.000.

Novar Electronics Corporation: *See—*
Stettner, Joseph C.; and Ott, James H., 4,103,294, Cl. 340-566.000.

Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,102,889, Cl. 260-296.00R.

Nudinger, Guenter: *See—*
Hemala, Zdenek; Nudinger, Guenter; and Wehrmeister, Gerhard, 4,102,115, Cl. 57-34.00R.

Nutt, Ruth F., to Merck & Co., Inc. Cyclization of peptides. 4,102,877, Cl. 260-112.50R.

N.V. Industrieele Handelscombinatie Holland: *See—*
Pot, Hendrik, 4,102,064, Cl. 37-67.000.

Nygren, William C.: *See—*
Stock, Alvin L.; Roddis, Gravatt K.; and Nygren, William C., 4,102,598, Cl. 415-135.000.

Nyi, Kayson: *See—*
Sperry, Peter Reeves; Wiersema, Richard J.; and Nyi, Kayson, 4,102,843, Cl. 260-29.6RW.

O. F. Mossberg & Sons, Inc.: *See—*
Liedke, Carl F., 4,102,242, Cl. 89-191.00R.

O'Beirne-Ranelagh, Bawn. Thimbles. 4,102,480, Cl. 223-101.000.

Oberlin, Max E.: *See—*
Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., 4,103,277, Cl. 338-237.000.

O'Brien, John P.: *See—*
Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., 4,102,428, Cl. 181-116.000.

Occidental Petroleum Corporation: *See—*
Green, Norman W.; Duraiswamy, Kandaswamy; and Lumpkin, Robert E., 4,102,773, Cl. 208-8.000.

Oce-Andeno B.V.: *See—*
Howarth, Barrie D.; and Kobylecki, Ryszard J., 4,102,933, Cl. 260-613.00D.

Ochii, Kiyofumi: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,103,345, Cl. 365-190.000.

Ochs, Stefan Albert, to RCA Corporation. Wafer mounting structure for pickup tube. 4,103,203, Cl. 313-390.000.

O'Connell, Walter: *See—*
Woodward, Robert John; and O'Connell, Walter, 4,102,335, Cl. 128-68.100.

O'Connolly, Patrick: *See—*
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.

Ogata, Masao: *See—*
Fukui, Masahiko; Sako, Hiromi; and Ogata, Masao, 4,103,221, Cl. 323-92.000.

Ogata, Masaru: *See—*
Kabayama, Takahiko; Ogata, Masaru; and Ikezawa, Tetsuro, 4,103,100, Cl. 13-20.000.

Ogawa, Masahide: *See—*
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.

Ogawa, Naoki: *See—*
Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, 4,102,217, Cl. 74-492.000.

Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, to Meiji Seika Kaisha, Ltd. Novel antibiotics derivatives and process for preparing the same. 4,103,083, Cl. 542-427.000.

Ogushi, Yasutomo: *See—*
Fukuba, Kozo; Ogushi, Yasutomo; and Harada, Haruhisa, 4,102,697, Cl. 106-111.000.

Ohata, Katsuya: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.

Ohe, Takeshi: *See—*
Hihara, Sokichi; Horiuchi, Mikio; and Ohe, Takeshi, 4,102,348, Cl. 128-422.000.

Ohio State University Research Foundation, The: *See—*
Mitscher, Lester Allen; Clark, George Winfred, III; and Bokelman, Gordon Herman, 4,103,091, Cl. 560-106.000.

Ohta, Takaaki: *See—*
Nogami, Tomoyuki; and Ohta, Takaaki, 4,102,551, Cl. 303-24.00A.

Ohta, Tatsuo, to Konishiroku Photo Industry Co., Ltd. Developing roller and rinsing device. 4,102,306, Cl. 118-658.000.

Okada, Hiroo; Hirota, Moriyuki; and Uesugi, Masaaki, to Kurita Water Industries Limited. Method for cleaning of filter device. 4,102,786, Cl. 210-80.000.

Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, to Yamatake-Honeywell Co., Ltd. Densitometer. 4,102,177, Cl. 73-32.00R.

Okada, Yasutaka: *See—*
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.

Okamoto, Miyoshi; and Yoshida, Syusuke, to Toray Industries, Inc. Suede-like raised woven fabric and process for preparation thereof. 4,103,054, Cl. 428-91.000.

Okamoto, Taiichi, to Yoshida Kogyo K.K. Hand-operated profiling machine. 4,102,246, Cl. 90-13.200.

Okuhara, Toshiaki: *See—*
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.

Okumura, Jun: *See—*
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,103,085, Cl. 544-27.000.

Okuno, Tetsuya: *See—*
Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.

Okuno, Youichi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.

Okutsu, Masaru: *See—*
Kida, Takao; Mizuno, Hiroshi; and Okutsu, Masaru, 4,102,672, Cl. 71-106.000.

Olander, Walter Karl, to General Electric Company. Moderation of manganese chelate catalyzed polymerization of phenolic monomers with polyfunctional alkanolamines. 4,102,865, Cl. 528-215.000.

Oliveri, Joseph T. Hair curling iron and oven. 4,103,145, Cl. 219-222.000.

Ollenbach, Ernest C., to Motorola, Inc. Sealing press for automated assembly apparatus. 4,102,481, Cl. 228-6.00R.

Olschewski, Wilfred W., to Burr-Brown Research Corporation. Hybrid transformer device. 4,103,267, Cl. 336-65.000.

Olschweski, Armin: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Olschweski, Armin, 4,102,553, Cl. 308-6.00C.

Olsen, Merle Victor: *See*—
DeNigris, Ernest Gerard; and Olsen, Merle Victor, 4,103,126, Cl. 200-67.00C.

Olympus Optical Co., Ltd.: *See*—
Ikuno, Yuzi; and Tanaka, Yutaka, 4,102,341, Cl. 128-303.140.
Sato, Masaaki; and Saito, Shoichi, 4,102,452, Cl. 206-387.000.

O'Mahoney, Joseph F., Jr., to Goodyear Tire & Rubber Company, The. Green strength of synthetic elastomers. 4,103,077, Cl. 526-51.000.

O'Meara, Thomas R., to Hughes Aircraft Company. Dual-wavelength coherent optical adaptive systems. 4,102,572, Cl. 356-5.000.

Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., to Gulf Research & Development Company. Isomeric dicarboxy, di (hydroxymethyl), diphenylmethanes as new compounds. 4,102,919, Cl. 260-520.00E.

Onopchenko, Anatoli; and Schulz, Johann G., to Gulf Research & Development Company. Beta, beta-dialkylethylmercaptoethoxylates as new compounds. 4,102,932, Cl. 260-609.00R.

Ookubo, Sajiro: *See*—
Akiyama, Taichiro; Ookubo, Sajiro; and Ueno, Setsuko, 4,102,342, Cl. 128-325.000.

Orban Associates, Inc.: *See*—
Orban, Robert A., 4,103,243, Cl. 328-169.000.

Orban, Robert A., to Orban Associates, Inc. Method and system for controlling peak signal levels in a bandlimited recording or transmission system employing high-frequency pre-emphasis. 4,103,243, Cl. 328-169.000.

Ordway, James F.: *See*—
Bailey, Edward A.; and Ordway, James F., 4,102,414, Cl. 175-85.000.

O'Rear, Jacques G.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,102,873, Cl. 528-331.000.

Oride, Akiyoshi: *See*—
Abe, Michiharu; and Oride, Akiyoshi, 4,103,071, Cl. 428-421.000.

Orisaka, Toru: *See*—
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.

Orthman, Henry K., to Orthman Manufacturing, Inc. Ground conditioning device and method of conditioning soil. 4,102,406, Cl. 172-540.000.

Orthman Manufacturing, Inc.: *See*—
Orthman, Henry K., 4,102,406, Cl. 172-540.000.

Orthmann, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Radiographic method and apparatus. 4,103,159, Cl. 250-315.00R.

Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,102,895, Cl. 260-340.600.

Osaka Denki Co., Ltd.: *See*—
Ueyama, Fumio; and Hattori, Tadashi, 4,102,483, Cl. 228-244.000.

Osgood, Alan A. Imparting anisotropy to foams by orienting added fibers whereby said fibers become parallely aligned. 4,102,831, Cl. 521-99.000.

Ost, Walter; Thomas, Klaus; and Prokic-Immel, Ricarda, to Celamerck GmbH & Co. KG. Derivatives of cyclopropane. 4,102,910, Cl. 260-453.0RW.

Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Method for hardening iron ore pellets. 4,102,674, Cl. 75-3.000.

Ostrem, Nels M. Steering wheel cover device. 4,102,377, Cl. 150-52.00M.

Oswald, Alexis A.: *See*—
Brenner, Douglas; and Oswald, Alexis A., 4,102,876, Cl. 526-19.000.

Ott, Clyde E. Part orienting and feeding mechanism. 4,102,034, Cl. 29-565.000.

Ott, James H.: *See*—
Stettner, Joseph C.; and Ott, James H., 4,103,294, Cl. 340-566.000.

Otte, Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Double drum vacuum filter. 4,102,791, Cl. 210-326.000.

Ovshinsky, Stanford R.: *See*—
Eisenberg, Adi; and Ovshinsky, Stanford R., 4,103,044, Cl. 427-56.000.

Owen, Harry; and Barrow, Thomas, to Pilkington Brothers Limited. Photochromic boro-silicate glass. 4,102,693, Cl. 106-54.000.

Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; and Spicer, John F., 4,102,302, Cl. 118-239.000.
Gagnon, Donald W., 4,103,065, Cl. 428-336.000.
Wertz, James B., 4,102,958, Cl. 264-40.600.

Ozaki, Tsutomu; and Enomoto, Kazuyoshi, to Kubota Ltd. Electronic weighing apparatus. 4,102,421, Cl. 177-185.000.

P. R. Mallory & Co. Inc.: *See*—
Homan, William N.; and Smock, Steve W., 4,103,119, Cl. 200-35.00R.

Paccar Inc.: *See*—
Kangas, Timothy J., 4,102,548, Cl. 296-1.00S.

Pace Incorporated: *See*—
Lee, Walter; and Litt, Kenneth C., 4,102,557, Cl. 312-257.00R.

Pacfex Aktiebolag: *See*—
Johnsson, Sven, 4,102,485, Cl. 229-23.00R.

Paepke, Horst. Filament feeding apparatus and method. 4,102,509, Cl. 242-47.040.

Paisley, John C. Partition structure. 4,102,089, Cl. 52-36.000.

Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich. Sliver placing device for draw frames and like machine. 4,102,016, Cl. 19-159.00R.

Pallai, Peter: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.

Palme, Karl, to Wehr Corporation. Stepped torque rotary motion brake. 4,102,444, Cl. 188-72.100.

Palmer, Norman H. G., to Towmotor Corporation. Motor control. 4,102,132, Cl. 60-433.000.

Paragon Resources, Inc.: *See*—
Feinberg, Emanuel, 4,102,629, Cl. 431-20.000.

Parker, Phillip H.: *See*—
Wedel, Carroll J.; and Parker, Phillip H., 4,102,861, Cl. 260-45.95E.

Parker, Robert Sydney Richard, to National Research Development Corporation. Hardenable sheet materials. 4,102,338, Cl. 128-90.000.

Parrish, David Richard: *See*—
Hajos, Zoltan George; and Parrish, David Richard, 4,102,929, Cl. 260-590.0FA.

Partyka, Richard Anthony: *See*—
Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, 4,102,885, Cl. 544-283.000.

Patel, Cowas G. Noise suppressor. 4,102,359, Cl. 138-42.000.

Paul Hammelmann Maschinenfabrik: *See*—
Broker, Erich, 4,102,611, Cl. 417-469.000.

Paulstra: *See*—
Bertin, Jacques, 4,102,538, Cl. 277-153.000.

Paving Products, Inc.: *See*—
Zanzie, Edward A., 4,102,590, Cl. 404-110.000.

Payer, Wolfgang: *See*—
Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, 4,102,913, Cl. 260-465.100.

Peabody Coal Company: *See*—
Campbell, John A. L.; and Moynihan, Daniel J., 4,102,550, Cl. 299-11.000.

Peacock Industries, Inc.: *See*—
Bahls, Harry, 4,102,702, Cl. 106-1.230.

Pearl, Maurice H.: *See*—
Hedges, Richard A.; and Pearl, Maurice H., 4,102,754, Cl. 204-275.000.

Pearson, Kenneth Carlton; and Lingle, Harrison Church, to Hartco Company. Spring fastener clips for wooden furniture rails. 4,102,586, Cl. 403-188.000.

Pearson, Michael: *See*—
Davies, John H.; Wood, Jack; and Pearson, Michael, 4,103,017, Cl. 424-270.000.

Pechiney Ugine Kuhlmann: *See*—
Blum, Jacques Marcel; and Ventre, Edmond, 4,102,740, Cl. 176-84.000.

Peddinghaus, Carl Ullrich; Hellkotter, Wolfgang; Einhaus, Albert; and Buschmann, Karl Robert, to Peddinghaus, Carl Ullrich. Cutting apparatus. 4,102,228, Cl. 83-156.000.

Peerts, Fernand; and Delaunois, Yvon, to Tessenderlo Chemie S.A. Preparation of organic polysulfide polymers using heavy residues from vinylchloride manufacture. 4,102,874, Cl. 528-387.000.

Pehl, Willis G.: *See*—
Barker, Frank S.; and Pehl, Willis G., 4,102,107, Cl. 52 553.000.

Pellin, Henri Maurice, to Bommer, Raymond. Negative ionizer. 4,102,654, Cl. 55-102.000.

Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of the cholecystokinin-pancreozymin octapeptide amide sulfate ester. 4,102,878, Cl. 260-112.50R.

Pennwalt Corporation: *See*—
Buchholz, Bernard, 4,102,931, Cl. 260-609.00B.
Moneghan, Edward, 4,102,620, Cl. 425-147.000.
Popoff, Ivan Christoff; and DeSavigny, Chester Blair, 4,102,800, Cl. 252-182.000.
Robinson, Donald Nellis; and Fox, Adrian Samuel, 4,102,760, Cl. 204-159.180.

Penton, Harold Roy, Jr.; and Wagener, Kenneth Boone, to Akzona Incorporated. Copolyesters of phthalic acids and hydantoins. 4,102,867, Cl. 528-289.000.

Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., to United States of America, Agriculture. Tris(ureidomethyl)phosphine oxides. 4,102,923, Cl. 260-553.00R.

Perdijon, Jean, to Commissariat a l'Energie Atomique. Device for inspecting a tube by ultrasonics. 4,102,206, Cl. 73-644.000.

Perkins & Powell Limited: *See*—
Jenkins, Albert Edward, 4,102,006, Cl. 16-51.000.

Perl, Richard L., to Tappan Company, The. Thermal valve. 4,102,496, Cl. 236-48.00R.

Perlegos, George; and Salsbury, Phillip J., to Intel Corporation. MOS Buffer circuit. 4,103,189, Cl. 307-270.000.
Perlmooser Zementwerke Aktiengesellschaft: *See*—
Kwech, Ludwig; and Jung, Fritz, 4,102,700, Cl. 106-100.000.
Perreten, Roger, to Etablissement d'Etudes et de Recherches Architecturales E.R.A. Building with external provision of services. 4,102,100, Cl. 52-227.000.
Persson, Kjell Stellan: *See*—
Linden, Lars Kalle; and Persson, Kjell Stellan, 4,103,149, Cl. 235-92.0TE.
Pessimissis, George N., to Nalco Chemical Company. Method for preparing an alumina as a support for a hydrotreating catalyst. 4,102,821, Cl. 252-463.000.
Peter, Karl: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.
Peters, Heinrich: *See*—
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 4,102,651, Cl. 23-277.00R.
Peterson, Henry T.: *See*—
McGreivy, Denis J.; Peterson, Henry T.; and Leupp, Alex M., 4,103,297, Cl. 340-324.00M.
Petrakos, Nicholas: *See*—
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
Petrich, Gerhard O.: *See*—
Neblung, Werner H.; and Petrich, Gerhard O., 4,102,529, Cl. 256-70.000.
Petrini, Richard R.: *See*—
Lord, David E.; Petrini, Richard R.; and Carter, Gary W., 4,102,582, Cl. 356-241.000.
Petrow, Henry G.; and Allen, Robert J., to Prototech, Inc. Finely particulated colloidal platinum, compound and sol for producing the same, and method of preparation. 4,102,819, Cl. 252-460.000.
Petry, Henry Alfred; and deVersterre, William I., to Marotta Scientific Controls, Inc. Load transfer block for rolling mills. 4,102,171, Cl. 72-245.000.
Pettifer, Lionel Joseph William. Budding gun. 4,102,078, Cl. 47-7.000.
Petzold, Werner Paul: *See*—
Miller, Alan Leonard; and Petzold, Werner Paul, 4,102,222, Cl. 74-866.000.
Pfeiffer, Hans Jorg; Rene, Keller; and Erich, Frank, to Sulzer Brothers Ltd. Method for removing acids from an aqueous acid-containing xylose solution. 4,102,705, Cl. 127-37.000.
Pfizer Inc.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,102,894, Cl. 260-332.30R.
Phares, Lindsey J.; and Gendron, George J., to Raymond International Inc. Anchoring of structures. 4,102,143, Cl. 61-94.000.
Phillips, Alan G.: *See*—
Church, Peter K.; and Phillips, Alan G., 4,102,085, Cl. 51-295.000.
Phillips, David C.: *See*—
Smith, James D. B.; and Phillips, David C., 4,102,192, Cl. 73-339.00R.
Smith, James D. B.; and Phillips, David C., 4,102,193, Cl. 73-339.00R.
Smith, James D. B.; and Phillips, David C., 4,102,809, Cl. 252-408.000.
Phillips Fibers Corporation: *See*—
Stegelman, Albert F., 4,102,508, Cl. 242-18.0PW.
Phillips, James Hugh; David, Curt Ludwig; and Rogers, Michael James, to Newall Engineering Company, Ltd., The. Phase displaced measurement of contiguous spherical balls. 4,103,222, Cl. 324-207.000.
Phillips Petroleum Company: *See*—
Campbell, Robert W., 4,102,875, Cl. 528-388.000.
Carroll, James C.; and Johnson, Lewis T., 4,102,453, Cl. 206-507.000.
Coale, Harold D., deceased, 4,102,954, Cl. 264-24.000.
Harris, Jesse R., 4,102,937, Cl. 260-666.00P.
Johnson, Marvin M.; and Tabler, Donald C., 4,102,802, Cl. 252-184.000.
Myers, John W.; and Harris, Jesse R., 4,102,939, Cl. 260-683.00D.
Sanford, Richard A.; and Clardy, Edwin K., 4,103,177, Cl. 250-562.000.
Snell, James B., 4,102,179, Cl. 73-61.10C.
Vanderveen, John W.; and Hunt, Harold R., 4,102,967, Cl. 264-113.000.
Williams, Keith A., 4,102,187, Cl. 73-209.000.
Phillips, Raymond M. Water bed mattress. 4,101,995, Cl. 5-371.000.
Phillips, Richard Antony: *See*—
Taylor, John Crawshaw; and Phillips, Richard Antony, 4,103,271, Cl. 337-372.000.
Phillips, William A.; and Dietz, David R., to Granco Equipment, Inc. Furnace with heat exchanger flow control. 4,102,636, Cl. 432-30.000.
Picker Corporation: *See*—
Gacki, Leonard W.; and Daly, Robert E., 4,103,358, Cl. 366-153.000.
Picquendar, Jean-Edgar; and Sokoloff, Boris, to Thomson-CSF. Telephone transmission system comprising digitally processing frequency multiplexor and demultiplexor. 4,103,110, Cl. 179-15.0FD.
Pies, Wilfried; and Brandt, Reinhard, to Krautkramer-Branson, Incorporated. Method and apparatus for ultrasonic nondestructive testing of workpieces with automatic compensation for the probe, workpiece material, and temperature. 4,102,205, Cl. 73-626.000.
Pilipovich, Donald; Goldberg, Ira B.; and Wagner, Ross I., to Rockwell International Corporation. Method for producing singlet molecular oxygen. 4,102,950, Cl. 423-579.000.
Pilkington Brothers Limited: *See*—
Owen, Harry; and Barrow, Thomas, 4,102,693, Cl. 106-54.000.
Pinkham, Herbert G., to Caterpillar Tractor Co. Method for forming a tire carcass having an opening. 4,102,723, Cl. 156-120.000.
Pirre, Frank A., Jr.; and McGovern, Andrew, to Pirre, Frank A., Jr.; and McGovern, Andrew J., part interest to each. Rider propelled vehicle. 4,102,542, Cl. 280-207.000.
Pizzarello, Frank A.; and LaChapelle, Theodore J., Jr., to United States of America, Air Force. Low inductance heater configuration for solid state devices and microcircuit substrates. 4,103,144, Cl. 219-209.000.
Plamper, Gerhard R., to MTD Products Inc. Fair-leads for a control wire. 4,102,219, Cl. 74-502.000.
Plantard, Dominique: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,102,662, Cl. 65-5.000.
Platts, Douglas John, to General Descaling Company Limited. Closure member. 4,102,474, Cl. 220-323.000.
Pleion Corporation: *See*—
Gartung, Clifford W., 4,102,095, Cl. 52-122.000.
Pleshkov, Mikhail Grigorievich: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Plessey Handel und Investments A.G.: *See*—
Stewart, William James, 4,102,579, Cl. 356-201.000.
Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, to Glaverbel-Mecaniver. Diffusion treatments for modifying the properties of glass and vitrocrystalline materials. 4,102,665, Cl. 65-30.00E.
Plummer, William T., to Polaroid Corporation. Unicell photoelectric photometer. 4,102,581, Cl. 356-225.000.
Pohl, Siegfried: *See*—
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.
Poignant, Jean-Claude: *See*—
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 4,102,890, Cl. 260-307.00F.
Poirier, Raymond; Hubert, Yves; and Lakhoua, Noureddine, to Thomson-CSF. Charge coupled correlator device. 4,103,333, Cl. 364-824.000.
Polaroid Corporation: *See*—
Gerber, Arthur M.; and Walworth, Vivian K., 4,102,758, Cl. 204-94.000.
Gerber, Arthur M.; and Walworth, Vivian K., 4,102,759, Cl. 204-94.000.
Greenwald, Richard B., 4,102,684, Cl. 96-61.00M.
Plummer, William T., 4,102,581, Cl. 356-225.000.
Taylor, Lloyd D., 4,102,685, Cl. 96-73.000.
Pole, Robert Vladimir: *See*—
Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, 4,103,346, Cl. 365-216.000.
Pollman, Frederic W.: *See*—
Reynolds, David W.; and Pollman, Frederic W., 4,102,131, Cl. 60-431.000.
Polychrome Corporation: *See*—
Weinberger, Lester; and Daskin, Robin, 4,102,686, Cl. 96-91.00R.
Popoff, Ivan Christoff; and DeSavigny, Chester Blair, to Pennwalt Corporation. Microencapsulated vulcanizing agents. 4,102,800, Cl. 252-182.000.
Popov, Dmitry Mikhailovich: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Porraz, Mauricio; and Klose, Margret, to Porraz, Mauricio. Coating and protective device. 4,102,137, Cl. 61-38.000.
Porth, Frank L., to Black, James A. Squeegee, ink scoop and flood blade assembly. 4,102,266, Cl. 101-124.000.
Portyrata, Raymond E., to Diaclear, Inc. Filter underdrain. 4,102,790, Cl. 210-293.000.
Post Office, The: *See*—
Hensel, Paul Christopher, 4,102,717, Cl. 156-64.000.
Pot, Hendrik, to N.V. Industrieele Handelscombinatie Holland. Swell compensator for suction dredging system. 4,102,064, Cl. 37-67.000.
Potterton International Limited: *See*—
Goff, Paul Frederick; Knight, Bernard William; and Prentice, Kenneth James, 4,102,628, Cl. 431-43.000.
Powers, John Vincent: *See*—
Castellani, Eugene Evans; Powers, John Vincent; and Romankiw, Lubomyr Taras, 4,102,756, Cl. 204-43.00T.

Powers, Larry J.: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,103,016, Cl. 424-270.000.

PPG Industries, Inc.: *See—*
Ammons, Vernon G., 4,103,070, Cl. 428-412.000.
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,102,863, Cl. 528-111.000.
Ecke, George G., 4,103,031, Cl. 424-337.000.
Shoop, George W., 4,102,722, Cl. 156-99.000.
Simko, Gabriel, 4,102,227, Cl. 83-7.000.
Stephenson, Richard M., 4,102,753, Cl. 203-64.000.

Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co.: *See—*
Schneider, Eberhard, 4,102,343, Cl. 128-327.000.

Preiswerk, Martin: *See—*
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 4,102,857, Cl. 260-45.80N.

Prentice, Kenneth James: *See—*
Goff, Paul Frederick; Knight, Bernard William; and Prentice, Kenneth James, 4,102,628, Cl. 431-43.000.

Price, Jerry L., to Monsanto Company. Purification of carbonylation products. 4,102,922, Cl. 260-532.000.

Pringle, William L, to United States Steel Corporation. Method of fabricating furniture spring support. 4,102,032, Cl. 29-520.000.

Pritz, Peter G. Heater for butter and the like. 4,102,323, Cl. 126-261.000.

Procter & Gamble Company, The: *See—*
Matheson, J. Neal; and Richardson, David L., 4,102,823, Cl. 252-533.000.
Morton, Wendell J., 4,102,737, Cl. 162-113.000.
Zaki, Wahib Nassif; and Murphy, Alan Pearce, 4,103,047, Cl. 427-242.000.

Product Design & Engineering Inc.: *See—*
Mathison, Donald W., 4,102,623, Cl. 425-393.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Duperray, Gilbert; Monnet, Andre; and Tournut, Claude, 4,102,966, Cl. 264-112.000.
Fournier, Pierre Louis Edmond; and Mayer, Jean Paul, 4,102,704, Cl. 106-288.00Q.

Proefrock, Paul R., to Sargent & Greenleaf, Inc. Enshrouding lock device for paired locking bars and the like. 4,102,161, Cl. 70-42.000.

Prokic-Immel, Ricarda: *See—*
Ost, Walter; Thomas, Klaus; and Prokic-Immel, Ricarda, 4,102,910, Cl. 260-453.0RW.

Prost, Hans: *See—*
Deserno, Peter; and Prost, Hans, 4,103,236, Cl. 325-132.000.

Prototech, Inc.: *See—*
Petrow, Henry G.; and Allen, Robert J., 4,102,819, Cl. 252-460.000.

Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 4,102,229, Cl. 83-712.000.
Pryor, Roy R.; and Pryor, Harold A., 4,102,460, Cl. 214-6.00C.

Pryor, Roy R.; and Pryor, Harold A. Sawmill log turning apparatus. 4,102,229, Cl. 83-712.000.

Pryor, Roy R.; and Pryor, Harold A. Timber stacking assembly. 4,102,460, Cl. 214-6.00C.

Psaras, John D.; and Sachleben, Leroy R., to Brown & Williamson Tobacco Corporation. Method and apparatus for moisturizing tobacco stems. 4,102,349, Cl. 131-135.000.

Puariea, Douglas A.: *See—*
Hackbarth, Richard W.; and Puariea, Douglas A., 4,102,212, Cl. 74-89.220.

Pugliese, Charles. Temporary shelter. 4,102,353, Cl. 135-5.00R.

Pusch, Gunter, to Ciba-Geigy Corporation. process for the manufacture of urea-HCHO-isobutyraldehyde condesnation products and compositions thereof. 4,102,840, Cl. 260-29.40R.

Puskarz, Stanley J., to A-T-O Inc. Drive mechanism for container filling machine. 4,102,366, Cl. 141-150.000.

Putter, Irving; and Cole, Lucille J., to Merck & Co., Inc. Acid degradation products of boromycin. 4,102,997, Cl. 424-115.000.

Quarderer, George J.; and Moll, Norman G., to Dow Chemical Company, The. Conversion process for solid, hydrocarbonaceous materials. 4,102,775, Cl. 208-10.000.

Quinn, Clayton B., to General Electric Company. Preparation of dichloroketene-ketals. 4,102,934, Cl. 260-613.00R.

R. Alkan & Cie: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,102,520, Cl. 244-137.00R.

Raasch, Hans; and Grecksch, Hans, to W. Schlafhorst & Co. Device for controlling the contact pressure of a textile coil on a support or driving cylinder. 4,102,506, Cl. 242-18.0DD.

Raasch, Hans: *See—*
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.

Rackin, Mark Henry: *See—*
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.

Radiant Technology Corporation: *See—*
Crain, N. Robert; Romance, Joseph S.; and Richert, Carson T., 4,103,319, Cl. 361-106.000.

Raffensberger, Larry Allan: *See—*
Harnish, James Ranck; and Raffensberger, Larry Allan, 4,102,390, Cl. 165-29.000.

Ramos, Joel A.: *See—*
Evans, David M.; and Ramos, Joel A., 4,103,129, Cl. 200-144.00R.

Rampe, John F., to Rampe Research. Methods and apparatus for ductlessly circulating and selectively supplementally heating large volumes of air in industrial facilities. 4,103,146, Cl. 219-368.000.

Rampe Research: *See—*
Rampe, John F., 4,103,146, Cl. 219-368.000.

Ramsey, Henry R.: *See—*
Levine, Alexander M.; and Ramsey, Henry R., 4,101,992, Cl. 5-260.000.

Rancourt, Yvon, to Dolphin Brake Corp., The. Disc brake assembly. 4,102,438, Cl. 188-18.00A.

Rando Machine Corporation: *See—*
Wood, Dennis E., 4,102,963, Cl. 264-91.000.

Ransom, Robert C.; and Holm, LeRoy W., to Union Oil Company of California. Determining residual oil saturation following flooding. 4,102,396, Cl. 166-252.000.

Rao, Kalur Vijaya Chandra. Production of hydrocarbons by thermolysis of vegetable oils. 4,102,938, Cl. 260-676.00R.

Raphael, Ralph Alexander, to Imperial Chemical Industries Limited. Preparation of a 5-(2,2-dihalovinyl)-4,4-dimethyl-2-oxotetrahydrofuran. 4,102,896, Cl. 260-343.600.

Rapid Mounting & Finishing Company: *See—*
Rutchik, Robert K., 4,102,068, Cl. 40-491.000.

Raque Food Systems Inc.: *See—*
Raque, Glenn F.; and Robinson, Edward A., 4,102,113, Cl. 53-366.000.

Raque, Glenn F.; and Robinson, Edward A., to Raque Food Systems Inc. Cover feeding apparatus. 4,102,113, Cl. 53-366.000.

Ratledge, R. Houston, Jr.: *See—*
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,102,262, Cl. 100-53.000.

Rau, Karlheinz: *See—*
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.

Rausnitz, Peter: *See—*
Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, 4,102,181, Cl. 73-119.00A.

Rautio, Kauko. Machine for hewing small square timber. 4,102,369, Cl. 144-114.00R.

Ravas, Richard J.: *See—*
Kernick, Andress; Ravas, Richard J.; and Geyer, Manvel A., 4,102,436, Cl. 187-29.00R.

Raven, Clive A.: *See—*
Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., 4,102,671, Cl. 71-98.000.

Raven, David P.: *See—*
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.

Raymond International Inc.: *See—*
Phares, Lindsey J.; and Gendron, George J., 4,102,143, Cl. 61-94.000.

Raymond Lee Organization, Inc., The: *See—*
Barber, Charles R., 4,102,294, Cl. 116-103.000.
Cruz, Herbert, 4,102,159, Cl. 68-132.000.
Fulker, Mabel H., 4,102,346, Cl. 128-419.0PS.
Jones, Germaine T., 4,102,002, Cl. 15-119.00A.
Martin, Herbert U., 4,102,076, Cl. 46-220.000.

Raytheon Company: *See—*
Braun, Martin, 4,103,198, Cl. 313-60.000.

RCA Corporation: *See—*
Credelle, Thomas Lloyd, 4,103,204, Cl. 313-422.000.
Credelle, Thomas Lloyd, 4,103,205, Cl. 313-422.000.
Denes, George, 4,103,185, Cl. 307-238.000.
DiPiazza, James John, 4,102,683, Cl. 96-38.400.
Ham, William Edward, 4,103,228, Cl. 324-65.00R.
Limberg, Allen LeRoy, 4,103,246, Cl. 330-278.000.
Miller, Arthur, 4,102,560, Cl. 350-96.190.
Morton, George Ira, 4,103,188, Cl. 307-251.000.
Ochs, Stefan Albert, 4,103,203, Cl. 313-390.000.
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, 4,103,183, Cl. 307-214.000.
Wheatley, Carl Franklin, Jr., 4,103,219, Cl. 323-8.000.
Woodward, Oakley McDonald, 4,103,262, Cl. 333-6.000.

Reach Electronics, Inc.: *See—*
Najork, Jack, 4,103,241, Cl. 325-373.000.

Reade, Grahame Melvin; and Viney, Alan Charles, to Imperial Chemical Industries Limited. Apparatus for coating plastic film. 4,102,301, Cl. 118-67.000.

Reade, Richard F.: *See—*
Mizzoni, Mary S.; and Reade, Richard F., 4,102,805, Cl. 252-301.40F.

Reber, Otto: *See—*
Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, 4,102,639, Cl. 8-1.00A.

Redding, Robert J., to Browne-Davies Electronic Corporation. Alarm device. 4,103,298, Cl. 340-331.000.

Redman, Charles, to United States of America, Army. Electronic device for processing signals in three dimensions. 4,103,199, Cl. 313-101.000.

Reece, Wendell Dale: *See—*
Fox, Robert Eugene; and Reece, Wendell Dale, 4,102,540, Cl. 280-5.00H.

Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., to John Zink Company. Draft tell-tale for fired furnaces. 4,102,627, Cl. 431-16.000.

Refreshment Machinery Incorporated: *See—*
Meacham, Thomas E., Jr.; and Johnson, David C., 4,102,645, Cl. 21-102.00R.
Regenos, Kenneth M.; and Barbano, Normand, to United States of America, Army. Frequency scanned corner reflector antenna. 4,103,303, Cl. 343-100.0SA.
Regie Nationale des Usines Renault: *See—*
Dera, Alain; and Goupy, Marcel, 4,101,983, Cl. 2-412.000.
Reichert, Donald G., to ABC Packaging Machine Corporation. Continuous motion apparatus and method for sealing cartons. 4,102,252, Cl. 93-36.300.
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., to Structural Instrumentation, Inc. Method of installing a transducer on a structural member. 4,102,031, Cl. 29-464.000.
Reid, Joyce: *See—*
Hauck, Frederic P.; and Reid, Joyce, 4,103,095, Cl. 560-252.000.
Reid, Peter, to Westland Aircraft Limited. Ground traction devices. 4,102,423, Cl. 180-7.00R.
Reiff, Karl; and Masur, Klaus, to Fa. C. Stiefelmauer K.G. Side-bar for measuring and/or tracing device. 4,102,051, Cl. 33-174.00P.
Reilly, Francis X., to Leslie Co. Acoustical signal apparatus. 4,102,297, Cl. 116-142.0FP.
Reimer, Richard C., to Equipto Electronics Corporation. Instrument cabinet. 4,102,554, Cl. 312-107.000.
Reinhard, Max: *See—*
Noguchi, Haruo; and Reinhard, Max, 4,103,357, Cl. 366-152.000.
Reis, Robert D., to United Electric Controls Company. Plug-in pressure switch. 4,103,124, Cl. 200-51.00R.
Rembaum, Alan; and Yen, Shiao-Ping Siao, to California Institute of Technology. Novel polyelectrolytes. 4,102,827, Cl. 260-823.000.
Renaud, Jean, to Colgate-Palmolive Company. Liquid detergent. 4,102,826, Cl. 252-548.000.
Rene, Keller: *See—*
Pfeiffer, Hans Jorg; Rene, Keller; and Erich, Frank, 4,102,705, Cl. 127-37.000.
Repetto, Stephen, to Loctite Corporation. Stabilized anaerobic adhesives. 4,103,081, Cl. 526-323.100.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; and Repke, Virginia L., 4,102,340, Cl. 128-287.000.
Reuther, John F.: *See—*
Yannone, Robert A.; and Reuther, John F., 4,103,178, Cl. 290-40.00R.
Reynolds, David W.; and Pollman, Frederic W., to Sundstrand Corporation. Integrated transmission-engine control. 4,102,131, Cl. 60-431.000.
Reynolds Metals Company: *See—*
Baker, John E.; and Shackford, Charles C., 4,102,955, Cl. 264-25.000.
Reyrolle Parsons Limited: *See—*
Anderson, Antony Faithfull, 4,103,194, Cl. 310-68.00D.
Rheinmetall GmbH.: *See—*
Bethmann, Karl-Wilhelm, 4,102,271, Cl. 102-52.000.
Rhone-Poulenc Industries: *See—*
Crochemore, Michel; and Gay, Michel, 4,102,839, Cl. 260-23.0XA.
Rhone-Poulenc, S.A.: *See—*
Lesaicherre, Andre; and Linguenheld, Louis, 4,103,045, Cl. 427-82.000.
Rich, Bernard J., to Societe Anonyme pour l'Equipement Electrique des Vehicules s.E.V. Marchal; and S.E.V. Alternateurs. Method of manufacturing a curved component of a magnetic circuit. 4,102,040, Cl. 29-598.000.
Richardson, David L.: *See—*
Matheson, J. Neal; and Richardson, David L., 4,102,823, Cl. 252-533.000.
Richert, Carson T.: *See—*
Crain, N. Robert; Romance, Joseph S.; and Richert, Carson T., 4,103,319, Cl. 361-106.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
Ricoh Co., Ltd.: *See—*
Abe, Michiharu; and Oride, Akiyoshi, 4,103,071, Cl. 428-421.000.
Horigome, Hirofumi, 4,103,311, Cl. 354-152.000.
Ridgeway, Louis H., to Facetglas, Inc. Method for manufacturing rigid articles having a cushioned surface. 4,102,964, Cl. 264-92.000.
Riedel, Dieter. Decatizing of fabrics. 4,102,643, Cl. 8-149.300.
Rife, Douglas D.: *See—*
Lapornik, Edward F.; and Rife, Douglas D., 4,102,575, Cl. 356-125.000.
Rinker, Jack R.: *See—*
Badger, John P.; and Rinker, Jack R., 4,102,024, Cl. 29-6.200.
Risser, Dale M.: *See—*
Martin, Eugene G.; and Risser, Dale M., 4,102,014, Cl. 17-11.000.
Rist, Michel, to Societe Anonyme Francaise du Ferodo. Hydraulically operated clutch. 4,102,446, Cl. 192-91.00A.
Ritter, Wilhelm F. K. G. Reversible roller pump with longer hose wear. 4,102,612, Cl. 417-477.000.
Ritzerfeld, Gerhard. Feeding of sheets and cards in a rotary duplicator machine capable of whole-page and linewise printing. 4,102,267, Cl. 101-132.500.
Rizla Limited: *See—*
Crisp, David, 4,102,634, Cl. 431-298.000.
Robert Bosch GmbH: *See—*
Bischoff, Guido, 4,102,601, Cl. 416-183.000.
Gansert, Willi; and Zipperer, Martin, 4,103,321, Cl. 361-388.000.
Ito, Nobuo, 4,103,193, Cl. 310-68.00D.
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, to S.A. des Cableries & Trefileries de Cossonay; Societe d'Exploitation des Cables Electriques; and Cableries de Brugg S.A. Apparatus for continuously coating a metal wire at high velocity. 4,102,300, Cl. 118-67.000.
Roberts, W. L., to Beatrice Foods Co. Egg replacer composition and method of production. 4,103,038, Cl. 426-601.000.
Robinson, Donald Nellis; and Fox, Adrian Samuel, to Pennwalt Corporation. Chlorination of poly (vinylidene fluoride) using U-V radiation. 4,102,760, Cl. 204-159.180.
Robinson, Edward A.: *See—*
Raque, Glenn F.; and Robinson, Edward A., 4,102,113, Cl. 53-366.000.
Robinson, Frank; and Whatmough, Nigel Stephen, to Courtaulds Limited. Knitting method. 4,102,155, Cl. 66-176.000.
Robinson, Geoffrey H.; and Robinson, Ronald F. Automatic sharpening machine for saw chains. 4,102,223, Cl. 76-25.00A.
Robinson, Michael; Mobbs, David Barry; and Talati, Kirit, to Laporte Industries, Limited. Production of carbon from coal granules prepared in a fluid energy mill. 4,102,812, Cl. 252-421.000.
Robinson, Robert Earl; and Ernst, John Alan, to Lindau Chemicals, Inc. Additive and method for reducing the drift of aqueous spray compositions. 4,102,667, Cl. 71-3.000.
Robinson, Ronald F.: *See—*
Robinson, Geoffrey H.; and Robinson, Ronald F., 4,102,223, Cl. 76-25.00A.
Robinson, Wiley B., to Houston Well Screen Company. Protected well screen. 4,102,395, Cl. 166-231.000.
Robson, Alan L.: *See—*
Hawkes, David A.; Robson, Alan L.; and Uemlianin, Andray, 4,102,530, Cl. 266-46.000.
Rockerath, John L.; and Blum, John H., to Cluett, Peabody & Co., Inc. Skipped stitch detector for chain stitch sewing machines. 4,102,283, Cl. 112-131.000.
Rockwell International Corporation: *See—*
Christe, Karl O.; and Schack, Carl J., 4,102,984, Cl. 423-301.000.
Marmet, Melvin L., 4,103,349, Cl. 365-231.000.
Pilipovich, Donald; Goldberg, Ira B.; and Wagner, Ross I., 4,102,950, Cl. 423-579.000.
Roddis, Gravatt K.: *See—*
Stock, Alvin L.; Roddis, Gravatt K.; and Nygren, William C., 4,102,598, Cl. 415-135.000.
Rody, Jean: *See—*
Hofmann, Peter; Muller, Helmut; and Rody, Jean, 4,102,870, Cl. 528-73.000.
Roeder, Allan W.; Kimball, Richard M.; and Koschmeder, Richard F., to General Electric Company. Velocity and drift angle tracking system using altimetry signals. 4,103,302, Cl. 343-9.000.
Roelse, Adriaan; and van der Ley, Barteld Hendrik, to Total Raffinaderij Nederland N.V. Removal of condensates from light gaseous streams. 4,102,647, Cl. 23-232.00R.
Rogall, Eugene W.: *See—*
Hsieh, Paul Y.; and Rogall, Eugene W., 4,103,043, Cl. 427-49.000.
Rogers, Edward J.; and Swanson, Roy T., to S & C Electric Company. Switch operating mechanism. 4,103,121, Cl. 200-48.00A.
Rogers, Michael James: *See—*
Phillips, James Hugh; David, Curt Ludwig; and Rogers, Michael James, 4,103,222, Cl. 324-207.000.
Rogers, Norman Harold: *See—*
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,901, Cl. 260-345.80R.
Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,904, Cl. 260-345.70R.
Rohde and Schwarz: *See—*
Betz, Tilman, 4,102,208, Cl. 73-647.000.
Rohm, Gunter Horst. Power-actuated chuck, especially for turning machines such as lathes. 4,102,539, Cl. 279-114.000.
Rohm and Haas Company: *See—*
Lewis, Sheldon N.; and Haggard, Richard A., 4,103,093, Cl. 560-205.000.
Sperry, Peter Reeves; Wiersema, Richard J.; and Nyi, Kayson, 4,102,843, Cl. 260-29.6RW.
Rohr, Gunter, to Union Special G.m.b.H. Stacker mechanism. 4,102,284, Cl. 112-121.290.
Rolls Royce (1971) Limited: *See—*
Hall, John Matthew, 4,102,499, Cl. 239-265.270.
Romance, Joseph S.: *See—*
Crain, N. Robert; Romance, Joseph S.; and Richert, Carson T., 4,103,319, Cl. 361-106.000.
Romankiw, Lubomyr Taras: *See—*
Castellani, Eugene Evans; Powers, John Vincent; and Romankiw, Lubomyr Taras, 4,102,756, Cl. 204-43.00T.
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., to Nabisco, Inc. Process for production of textured protein flakes. 4,103,034, Cl. 426-250.000.
Rookus, James E. Device to improve cutting action of electric shavers. 4,102,044, Cl. 30-34.200.
Root, Roland L.: *See—*
Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., 4,102,400, Cl. 166-283.000.
Rose, Henry B., to Curtis & Marble Corporation. Packaging machine. 4,102,112, Cl. 53-228.000.

Rosendahl, Friedrich-Karl: *See*—
Kubitzek, Harry; Feltgen, Karlheinz; and Rosendahl, Friedrich-Karl, 4,102,965, Cl. 264-103.000.
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, to RCA Corporation. Quasi-static inverter circuit. 4,103,183, Cl. 307-214.000.
Ross, Frederick W. Resilient work-coupled impact device. 4,102,410, Cl. 173-133.000.
Ross, Svante Bertil: *See*—
Carlsson, Per Arvid Emil; Carnmalm, Bernt Sigfrid Emanuel; Ross, Svante Bertil; and Ulff, Carl Bengt Johan, 4,102,887, Cl. 260-290.0HL.
Rosseels, Gilbert: *See*—
Gubin, Jean; and Rosseels, Gilbert, 4,103,012, Cl. 424-263.000.
Rossini, James L. Variable-length tool holder. 4,102,375, Cl. 145-75.000.
Roth, Ronald Arthur. Cursor assembly. 4,102,050, Cl. 33-76.00R.
Rottenkolber, Paul, to Volkswagenwerk Aktiengesellschaft. Rotor for an axial turbine. 4,102,602, Cl. 416-221.000.
Roveroni, Bruno. Decorating or shelf system. 4,102,276, Cl. 108-156.000.
Rowe, Edward A., Jr.; and Cawley, William H., to Diamond Shamrock Corporation. Adjuvant composition for solvent phosphatizing solution. 4,102,710, Cl. 148-6.15R.
Ruegsegger, Donald Ray. Process for producing fusible links. 4,102,482, Cl. 228-170.000.
Ruether, John A. Method and apparatus for carrying out hydrogenation reactions. 4,102,778, Cl. 208-143.000.
Rugh, John L., II. Municipal water supply system. 4,102,752, Cl. 202-180.000.
Ruhrchemie Aktiengesellschaft: *See*—
Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, 4,102,913, Cl. 260-465.100.
Runquist, Paul W. Stratified combustion furnace. 4,102,318, Cl. 126-103.000.
Russell, James B.: *See*—
Deming, Andrew F.; and Russell, James B., 4,103,238, Cl. 325-141.000.
Rutchik, Robert K., to Rapid Mounting & Finishing Company. Display device. 4,102,068, Cl. 40-491.000.
Rutshtein, Alexander; and Staroselsky, Naum, to Compressor Controls Corporation. Method and apparatus for noninteracting control of a dynamic compressor having rotating vanes. 4,102,604, Cl. 417-19.000.
Ryden, David John: *See*—
Spottiswoode, Nigel Lawrence; and Ryden, David John, 4,103,172, Cl. 250-462.000.
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., to Exxon Research & Engineering Co. Oxazoline additives useful in oleaginous compositions. 4,102,798, Cl. 252-51.50A.
Ryusyo Industrial Co., Ltd.: *See*—
Kawahara, Akira, 4,102,018, Cl. 24-68.0CD.
S & C Electric Company: *See*—
Evans, David M.; and Ramos, Joel A., 4,103,129, Cl. 200-144.00R.
Jackson, Hiram Soloman, Jr., 4,103,270, Cl. 337-178.000.
Jarosz, John M.; and Swanson, Roy T., 4,103,120, Cl. 200-48.00R.
Kalvaitis, Arvydas J., 4,102,475, Cl. 220-366.000.
Rogers, Edward J.; and Swanson, Roy T., 4,103,121, Cl. 200-48.00A.
S.E.V. Alternateurs: *See*—
Rich, Bernard J., 4,102,040, Cl. 29-598.000.
S. G. Frantz Company, Inc.: *See*—
Sun, Jack Ji-Nong; and Lewis, Dartrey, 4,102,780, Cl. 209-39.000.
S I Handling Systems, Inc.: *See*—
Wolbrink, David W.; and Speaker, Richard L., 4,102,448, Cl. 198-365.000.
Saaristo, Seppo, to Karhu-Titan Oy. Shoe sole structure. 4,102,061, Cl. 36-28.000.
Sabec, Charles J., to Towmotor Corporation. Compact steering axle assembly. 4,102,427, Cl. 180-156.000.
Sabourin, Edward T.: *See*—
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,102,919, Cl. 260-520.00E.
Sachleben, Leroy R.: *See*—
Psaras, John D.; and Sachleben, Leroy R., 4,102,349, Cl. 131-135.000.
Saegusa, Katsumi: *See*—
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,102,824, Cl. 252-545.000.
Safety Research & Engineering Corporation: *See*—
Cook, Edward J., 4,103,282, Cl. 340-58.000.
Safin, Ravil Safinovich: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Sai-Halasz, George Anthony: *See*—
Chang, Leroy Ligong; Esaki, Leo; and Sai-Halasz, George Anthony, 4,103,312, Cl. 357-16.000.
Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyzer heating device for an internal combustion engine. 4,102,127, Cl. 60-284.000.
Saiki, Noritsugu: *See*—
Kawamura, Takeo; Saiki, Noritsugu; Nakamura, Yoshitugu; and Tokashiki, Michiyuki, 4,102,853, Cl. 260-40.00R.
Saima, Michio: *See*—
Sasaki, Takashi; and Saima, Michio, 4,102,980, Cl. 423-239.000.
Saint-Gobain Industries: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,102,662, Cl. 65-5.000.
St. Luke's Hospital Research Foundation, Inc.: *See*—
Lucas, Roland T., 4,102,489, Cl. 229-73.000.
Saito, Chikara: *See*—
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.
Saito, Iwao: *See*—
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.
Saito, Mitsutaka: *See*—
Imura, Shinichi; Saito, Mitsutaka; and Morishita, Nobuo, 4,102,946, Cl. 260-878.00R.
Saito, Muneo; and Konishi, Hideki, to Japan Spectroscopic Co., Ltd. Method of sample introduction in the micro liquid chromatography and the apparatus therefor. 4,102,782, Cl. 210-31.00C.
Saito, Shoichi: *See*—
Sato, Masaaki; and Saito, Shoichi, 4,102,452, Cl. 206-387.000.
Saito, Yutaka; Yamamoto, Youichi; and Kojima, Hajime, to Matsushita Electric Works, Ltd. Coreless motor. 4,103,196, Cl. 310-266.000.
Sakabe, Nobuyuki, to Shin-Shirasuna Electric Corp. FM tuning indicator. 4,103,240, Cl. 325-349.000.
Sakamoto, Masao: *See*—
Naka, Mitsuru; and Sakamoto, Masao, 4,102,218, Cl. 74-493.000.
Sako, Hiromi: *See*—
Fukui, Masahiko; Sako, Hiromi; and Ogata, Masao, 4,103,221, Cl. 323-92.000.
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, to Canon Kabushiki Kaisha. Digital information input method. 4,103,308, Cl. 354-23.00D.
Salisbury, Wayne C., to McCord Corporation. Cold impact resistant urethane foam. 4,102,833, Cl. 521-159.000.
Saloom, Joseph T., to Wheatland Tube Company. End forming apparatus for elongated work pieces. 4,102,173, Cl. 72-306.000.
Salsbury, Phillip J.: *See*—
Perlegos, George; and Salsbury, Phillip J., 4,103,189, Cl. 307-270.000.
Salter, Larry, to Briles, Paul R. Method of installing a sleeve bolt in an opening. 4,102,036, Cl. 29-525.000.
Saltman, William M.: *See*—
Throckmorton, Morford C.; and Saltman, William M., 4,102,817, Cl. 252-429.00B.
Salyers, John C.: *See*—
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,102,262, Cl. 100-53.000.
Samoilov, Constantin. Needle threader. 4,102,478, Cl. 223-99.000.
Sampson, Alan J.: *See*—
Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., 4,102,671, Cl. 71-98.000.
Sander, Hans: *See*—
Hartmann, Heinrich; and Sander, Hans, 4,102,847, Cl. 260-31.40R.
Sanders, James Milton: *See*—
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.
Sando Iron Works Co. Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,102,158, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co. Ltd. Drain disposing device in seal mechanism on a cloth material inlet side of high pressure steamer. 4,102,158, Cl. 68-5.00E.
Sandonato, Saverio. Enema waste receptacle and frame. 4,101,991, Cl. 5-90.000.
Sandorf, Robert E.: *See*—
Kennon, James L.; and Sandorf, Robert E., 4,103,276, Cl. 338-214.000.
Sandoz, Inc.: *See*—
Nadelson, Jeffrey, 4,103,013, Cl. 424-263.000.
Sandoz Ltd.: *See*—
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 4,102,857, Cl. 260-45.80N.
Hodel, Christian, 4,103,014, Cl. 424-267.000.
Sanford, Richard A.; and Clardy, Edwin K., to Phillips Petroleum Company. Surface quality analysis. 4,103,177, Cl. 250-562.000.
Sanki Denshi Kogyo Kabushiki Kaisha: *See*—
Kaneko, Yoshiaki, 4,103,316, Cl. 361-3.000.
Sargent & Greenleaf, Inc.: *See*—
Miller, James Clayton, 4,102,162, Cl. 70-52.000.
Proefrock, Paul R., 4,102,161, Cl. 70-42.000.
Sarto, Jorma O., to Chrysler Corporation. Crankcase ventilation. 4,102,314, Cl. 123-119.00B.
Sasagawa, Shuzo: *See*—
Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, to Sumitomo Metal Industries, Limited. Refractory material for repairing blast furnaces. 4,102,694, Cl. 106-56.000.
Sasaki, Takashi; and Saima, Michio, to Japan Gasoline Co., Ltd.

Method for removal of dust deposited on contact apparatus interior. 4,102,980, Cl. 423-239.000.

Sasaki, Toshio, to Fujizoki Pharmaceutical Co., Ltd. Method and device for agitating a liquid. 4,102,649, Cl. 23-259.000.

Sashihara, Kenji; and Masuda, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Thermally developable light-sensitive materials. 4,102,312, Cl. 96-114.100.

Sasse, Wolfgang Herman Fritz; and Jackson, Mervyn Benjamin, to ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization. Process of preparing microspheres using electromagnetic radiation. 4,102,762, Cl. 204-159.220.

Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya. Obstacle detecting apparatus using ultrasonic waves. 4,103,278, Cl. 340-1.00R.

Satake, Yasuo: *See*—
Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.

Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, to Chisso Corporation. Method for producing polymers of alpha-olefin. 4,103,078, Cl. 526-115.000.

Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, to Fujitsu Limited. Attendant console control system. 4,103,113, Cl. 179-27.0CA.

Sato, Masaaki; and Saito, Shoichi, to Olympus Optical Co., Ltd. Storage case. 4,102,452, Cl. 206-387.000.

Sato, Takehiko: *See*—
Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.

Sato, Yasushi: *See*—
Masaki, Katsumi; Hirayama, Kazuhiro; and Sato, Yasushi, 4,103,156, Cl. 250-236.000.

Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,102,909, Cl. 260-404.000.
Cohen, Noal; and Saucy, Gabriel, 4,102,925, Cl. 260-570.600.

Sauer, Charlotte I.: *See*—
Freeman, Charles R.; and Sauer, Charlotte I., 4,102,835, Cl. 260-5.000.

Saurer-Allma GmbH: *See*—
Hemala, Zdenek; Nudinger, Guenter; and Wehrmeister, Gerhard, 4,102,115, Cl. 57-34.00R.

Saurer Diederichs (Societe Anonyme): *See*—
Deborde, Albert Henri, 4,102,363, Cl. 139-449.000.

Savio, Ermanno: *See*—
Gandini, Giuseppe; and Frignoli, Luigi, 4,102,794, Cl. 252-8.100.

Sawaguchi, Hirosi: *See*—
Sugiyama, Masatoshi; Sawaguchi, Hirosi; and Mitsui, Akio, 4,102,688, Cl. 96-139.000.

Saylor, B. Franklin: *See*—
Matulich, Dan S.; and Saylor, B. Franklin, 4,102,387, Cl. 165-1.000.

Sayre, Robert K., to United States of America, Energy. Method of shielding a liquid-metal-cooled reactor. 4,102,739, Cl. 176-38.000.

Scaglione, Felice: *See*—
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.

Scales, Stanley R., to Hughes Tool Company. Composition and method for selective boronizing. 4,102,838, Cl. 260-22.0CB.

Schaaf, Thomas K.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,102,894, Cl. 260-332.30R.

Schack, Carl J.: *See*—
Christe, Karl O.; and Schack, Carl J., 4,102,984, Cl. 423-301.000.

Schadenberg, Hendrik, to Shell Oil Company. Compounds containing both urea and urethane groups. 4,102,797, Cl. 252-51.50A.

Schafer, James P.: *See*—
Greever, James E.; and Schafer, James P., 4,102,027, Cl. 29-157.3AH.

Scharrenbroich, Helmut, to Voith-Fischer Kunststofftechnik GmbH & Co. KG. Apparatus for manipulating parisons in blow molding machines. 4,102,626, Cl. 425-526.000.

Schartau, Wolfgang; and Schwochow, Friedrich, to Bayer Aktiengesellschaft. Reinforcing glass fibers of MgO-CaO-ZnO-Al_2O_3-SiO_2-TiO_2. 4,102,692, Cl. 106-50.000.

Schattner, Robert I. Buffered phenol-glutaraldehyde sterilizing compositions. 4,103,001, Cl. 424-148.000.

Schelle, Axel; and Nell, Kuno, to Knorr-Bremse GmbH. Adaptor device for coupling railway vehicles having different types of couplers. 4,102,459, Cl. 213-112.000.

Schelp, Helmut R., to Garrett Corporation, The. High temperature gas turbine. 4,102,125, Cl. 60-39.530.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,102,908, Cl. 260-397.400.
Joppien, Hartmut, 4,103,007, Cl. 424-244.000.

Schering Corporation: *See*—
Neustadt, Bernard R.; and Zampaglione, Nicola, 4,103,018, Cl. 424-272.000.

Schexnayder, Lawrence F., to Caterpillar Tractor Co. Load check and bypass valve. 4,102,250, Cl. 91-412.000.

Schiffman, Murray M., to MBI, Inc. Method for producing a design on an arcuate surface. 4,102,734, Cl. 156-659.000.

Schlaf, Richard A.: *See*—
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.

Schlage Lock Company: *See*—
Schnarr, Raymond H.; and Jester, John P., 4,102,005, Cl. 16-49.000.

Schlauch, Richard M. Colloid free precipitation of heavy metal sulfides. 4,102,784, Cl. 210-47.000.

Schlemmer, Thomas: *See*—
Mushrush, George W.; and Schlemmer, Thomas, 4,102,504, Cl. 241-186.00R.

Schliebs, Reinhard; and Block, Hans-Dieter, to Bayer Aktiengesellschaft. Production of 3,4-dihydroxy phospholane oxides. 4,102,949, Cl. 260-985.000.

Schlossberg, Howard R. High power, compact waveguide gas laser. 4,103,255, Cl. 331-94.50C.

Schlosser, Helmut: *See*—
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.

Schlumberger Technology Corporation: *See*—
Strom, Gerald A.; and Bernard, James I., 4,103,281, Cl. 340-18.0LD.

Schmidt, Hans Heinrich. Transporter for slab casting tables. 4,102,463, Cl. 214-671.000.

Schmidt, Werner, to Lambda Physik GmbH & Co. KG. Apparatus for stimulated emission of coherent, continuously tunable Raman radiation. 4,103,179, Cl. 307-88.300.

Schmitt, Frederick Louis: *See*—
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.

Schnarr, Raymond H.; and Jester, John P., to Schlage Lock Company. Door closer arm. 4,102,005, Cl. 16-49.000.

Schneider, Eberhard, to Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co. Ligature mechanism for producing tourniquet effects on limbs. 4,102,343, Cl. 128-327.000.

Schneider, Theodore S. Low energy consumption air conditioning system. 4,102,392, Cl. 165-62.000.

Schneider, William P., to Upjohn Company, The. Dialkylacetal-containing thromboxane B, 1,9-lactone intermediates. 4,102,897, Cl. 260-343.000.

Schneider, William P., to Upjohn Company, The. Aldehyde-containing thromboxane B, 1,9-lactone intermediates. 4,102,898, Cl. 260-343.000.

Scholl, Hans-Joachim; Markusch, Peter; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Stable aqueous alkali metal silicate/iron oxide pigment suspensions. 4,102,699, Cl. 106-84.000.

Schottroff, Werner: *See*—
Hildebrandt, Peter; Veranneman, Georg; and Schottroff, Werner, 4,102,386, Cl. 164-259.000.

Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., to International Flavors & Fragrances Inc. Preparation of 1-(3,3-dimethyl-2-norbornyl)-2-propanone. 4,102,763, Cl. 204-162.00R.

Schroder, Georg; and Brehmer, Edgar, to Chemische Werke Huels Aktiengesellschaft. Spread-coating compositions for paper comprising an aqueous dispersion of styrene/butadiene polymer and polyethylene oxide. 4,102,845, Cl. 260-29.7NR.

Schroeder, Becky J. Portable cartridge contained electroluminescent sheet for reading and writing in the dark. 4,103,171, Cl. 250-458.000.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Apparatus for removing organic solvents from textile material. 4,102,157, Cl. 68-5.00D.

Schuler, Michael: *See*—
Morrow, Darrell R.; and Schuler, Michael, 4,102,488, Cl. 229-55.000.

Schultz, Norman Eugene: *See*—
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.

Schultz, Raymond P.: *See*—
Flynn, M. Rutledge; and Schultz, Raymond P., 4,102,495, Cl. 236-46.00R.

Schulz, Johann G.: *See*—
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,102,919, Cl. 260-520.00E.
Onopchenko, Anatoli; and Schulz, Johann G., 4,102,932, Cl. 260-609.00R.

Schulze, Harry O.; Dodds, Robert E.; and Herner, Raymond F., to GTE Sylvania Incorporated. Coated silver activated zinc sulfide cathode ray tube. 4,103,069, Cl. 428-403.000.

Schundehutte, Karl Heinz: *See*—
Kalk, Walter; Bien, Hans Samuel; and Schundehutte, Karl Heinz, 4,102,924, Cl. 260-562.00P.

Schuster, Frank C., to Little Giant Products, Inc. Pallet saver device for fork lift trucks. 4,102,464, Cl. 214-750.000.

Schwab, Gunter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Moving blade ring of high circumferential speed for thermal axially passed through turbines. 4,102,600, Cl. 416-91.000.

Schwartz, Charles A. Cooled lifting magnet with damped eddy currents and method for its fabrication. 4,103,266, Cl. 335-289.000.

Schwartz, Morris, to Kalart Victor Corporation. Sound slide. 4,102,569, Cl. 353-120.000.

Schwartz, Robert D.: *See*—
McCoy, Carleton J.; and Schwartz, Robert D., 4,102,744, Cl. 195-28.00R.

Schwarz, William M., to Xerox Corporation. Development system with electrical field generating means. 4,102,305, Cl. 118-651.000.

Schwarzbach, Christian: *See*—
Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, 4,102,056, Cl. 34-10.000.
Schwarzkopf, Daniel, to Unimax Switch Corporation. Rotary switch. 4,103,132, Cl. 200-153.0LB.
Schwede, Otto G., to Ford Motor Company. Electronic multichip module. 4,103,318, Cl. 361-388.000.
Schwinum, Ernst; Hornig, Heinz; and Matner, Martin, to Bayer Aktiengesellschaft. Dipped articles of rubber. 4,102,844, Cl. 260-29.70T.
Schwochow, Friedrich: *See*—
Schartau, Wolfgang; and Schwochow, Friedrich, 4,102,692, Cl. 106-50.000.
Science-Union et Cie, Societ Francaise de Recherche Medicale: *See*—
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 4,102,890, Cl. 260-307.00F.
SCM Corporation: *See*—
Laskin, Charles L.; and Memmer, Timothy I., 4,103,050, Cl. 427-379.000.
Scovill Manufacturing Company: *See*—
Dziura, Walter Henry, 4,102,165, Cl. 70-456.00B.
Scray, Eugene James, Jr.: *See*—
Gomez, Richard Santiago; and Scray, Eugene James, Jr., 4,103,135, Cl. 200-185.000.
Sebald, Ralf. Electrical generator for a sailboat. 4,102,291, Cl. 114-244.000.
Sebestyen, Ferenc: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel nee Szepespataki, Jolan, 4,102,948, Cl. 260-944.000.
Sechan, Charles J. Mobile radiotelephone apparatus and method. 4,103,106, Cl. 179-2.0EB.
Seher, Rolf: *See*—
Wolf, Horst; and Seher, Rolf, 4,103,210, Cl. 318-46.000.
Seiler, Karl: *See*—
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.
Seitz, Karl, to Ciba-Geigy Corporation. Benzoylated dehydrothio-p-toluidine sulfonic acid-azo-pyridone dyes. 4,102,880, Cl. 260-156.000.
Sekiguchi, Tadao, to Trio Kabushiki Kaisha. Digital frequency display device. 4,103,290, Cl. 340-168.00B.
Selden, Boynton, to Selden, Michele R., Trustee. Adjustable stand for needlework and the like. 4,102,065, Cl. 38-102.100.
Selden, Michele R., Trustee: *See*—
Selden, Boynton, 4,102,065, Cl. 38-102.100.
Seletzky, Peter Dresel: *See*—
Antlfinger, George John; and Seletzky, Peter Dresel, 4,102,841, Cl. 260-29.60N.
Selleslagh, Eduard: *See*—
Timmermans, Armand; Selleslagh, Eduard; and Deneyer, Jose N. E., 4,103,233, Cl. 324-208.000.
Service Master Industries, Inc.: *See*—
Beach, Rex E.; and Blomgren, Roland A., 4,102,462, Cl. 214-301.000.
Setter, Alfred C.: *See*—
Hyman, Charles E.; and Setter, Alfred C., 4,103,325, Cl. 363-148.000.
Seyl, Robert G. Corrosion probe. 4,102,769, Cl. 204-195.00C.
Shackford, Charles C.: *See*—
Baker, John E.; and Shackford, Charles C., 4,102,955, Cl. 264-25.000.
Shafer, Jon L.; and LeBlanc, William K., to Shafer Valve Company, a part interest. Hand pump system for hydraulic motor. 4,102,128, Cl. 60-400.000.
Shafer Valve Company: *See*—
Shafer, Jon L.; and LeBlanc, William K., 4,102,128, Cl. 60-400.000.
Shakertown Corporation: *See*—
Barker, Frank S.; and Pehl, Willis G., 4,102,107, Cl. 52-553.000.
Sharp, David E. Fruit picking receptacle. 4,102,376, Cl. 150-2.000.
Sharp Kabushiki Kaisha: *See*—
Washizuka, Isamu, 4,103,208, Cl. 315-51.000.
Sharpe, James R.: *See*—
Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., 4,102,400, Cl. 166-283.000.
Shaw, Kenneth R.: *See*—
Shegrud, Donald M.; and Shaw, Kenneth R., 4,102,469, Cl. 220-89.00A.
Shegrud, Donald M.; and Shaw, Kenneth R., to Continental Disc Corporation. Protected molded rupture disc. 4,102,469, Cl. 220-89.00A.
Shell Oil Company: *See*—
Blytas, George C., 4,102,388, Cl. 165-1.000.
Carr, John B., 4,103,021, Cl. 424-278.000.
Davies, John H.; Wood, Jack; and Pearson, Michael, 4,103,017, Cl. 424-270.000.
Gergen, William P.; and Davison, Sol, 4,102,854, Cl. 260-42.180.
Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., 4,102,671, Cl. 71-98.000.
Schadenberg, Hendrik, 4,102,797, Cl. 252-51.50A.
van Steveninck, Johannes; and Hogervorst, Johannes R., 4,102,145, Cl. 61-105.000.
Shelton, Glenn B.: *See*—
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.
Shelton, Kenneth William: *See*—
Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, 4,102,701, Cl. 106-111.000.
Shelton, Robert N., to Foster Grant Corporation. Rimless spectacle. 4,102,566, Cl. 351-131.000.
Shenfield, Leonard R., to Xerox Corporation. Time-slicing method and apparatus for disk drive. 4,103,326, Cl. 364-200.000.
Shenfield, Leonard R.: *See*—
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
Shephard, Kenneth P., to Upjohn Company, The. Desulfinylation process for preparing androsta-4,9(11)-diene-3,17-dione. 4,102,907, Cl. 260-397.300.
Sherock, Duane. Pipe thawing device. 4,102,358, Cl. 138-35.000.
Shibata, Shoji: *See*—
Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, 4,103,004, Cl. 424-177.000.
Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,102,858, Cl. 260-45.80N.
Shigeta, Junnosuke, to Matsushita Electric Industrial Co., Ltd. Waveform converter for altering the frequency spectrum of an output signal. 4,103,242, Cl. 328-35.000.
Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,102,713, Cl. 148-113.000.
Shima, Masao: *See*—
Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi; and Sonoi, Koya, 4,102,215, Cl. 74-243.0DR.
Nagano, Masashi, 4,102,216, Cl. 74-245.00R.
Shimazu, Yasuo: *See*—
Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya, 4,103,278, Cl. 340-1.00R.
Shimizu, Hiroshi: *See*—
Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.
Shimoda, Kazuho, to Konishiroku Photo Industry Co., Ltd. Transfer type copier. 4,102,570, Cl. 355-16.000.
Shin-Shirasuna Electric Corp.: *See*—
Sakabe, Nobuyuki, 4,103,240, Cl. 325-349.000.
Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, to Canon Kabushiki Kaisha. Exposure control device. 4,103,307, Cl. 354-23.00D.
Shinoda, Nobuhiko: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
Shinya, Nakai: *See*—
Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, 4,103,224, Cl. 324-58.50C.
Shiono, Hidehiro: *See*—
Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.
Shirinian, Genrikh Grigorievich: *See*—
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.
Shomura, Takashi: *See*—
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
Shonnard, John R.; and Natale, Rocco J. Apparatus for igniting charcoal briquettes. 4,102,317, Cl. 126-25.00B.
Shoop, George W., to PPG Industries, Inc. Method of making heated laminated window. 4,102,722, Cl. 156-99.000.
Short, Edward H., III: *See*—
Wood, Loren E.; and Short, Edward H., III, 4,102,167, Cl. 72-54.000.
Showa Denko K.K.: *See*—
Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, 4,102,962, Cl. 264-82.000.
Showa Oil Co., Ltd.: *See*—
Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, 4,102,983, Cl. 423-245.000.
Shufran, Steve, to United States Steel Corporation. Walking beam conveying apparatus and method. 4,102,449, Cl. 198-774.000.
Shulman, Abe; and Willing, Jere J., to A-Jer Engineering, Inc. Automatic filling device. 4,102,367, Cl. 141-231.000.
Shum, Lanson Y.: *See*—
Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., 4,103,226, Cl. 324-61.00R.
Shuster, Edward J.: *See*—
Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
Siano, James N.: *See*—
Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
Sickler, Fred H.: *See*—
Sommers, Richard L.; and Sickler, Fred H., 4,102,264, Cl. 101-77.000.
Sidbec-Dosco Ltee: *See*—
Dancy, Edna A., 4,102,708, Cl. 136-233.000.

Sidro GmbH & Co. Ludwig Moller: *See*—
Koser, Rolf, 4,102,169, Cl. 72-128.000.

Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Nematicidally and arthropodically active N-methyl-N-(2-toluenesulphonic acid methylamide-N'-sulphenyl)-2,2-dimethyl-2,3-dihydrobenzofuranyl-(7)-carbamate. 4,103,024, Cl. 424-285.000.

Siemens Aktiengesellschaft: *See*—
Auinger, Herbert; Lang, Walter; and Mader, Manfred, 4,103,217, Cl. 322-28.000.
Deserno, Peter; and Prost, Hans, 4,103,236, Cl. 325-132.000.
Dietze, Wolfgang; and Stut, Hans, 4,102,298, Cl. 118-5.000.

Sierant, Stanley Leslie. Baths. 4,101,988, Cl. 4-173.00R.

Signode Corporation: *See*—
Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., 4,102,364, Cl. 141-4.000.

Sih, Charles J., to Wisconsin Alumni Research Foundation. Glycosides of 2,6-bis(hydroxy-phenyl)-3,7-dioxabicyclo [3,3,0] octane. 4,103,006, Cl. 424-181.000.

Siiberg, Hemming G., to Wagner Electric Corporation. Fluid bilevel sensor. 4,103,265, Cl. 335-205.000.

Simerl, R. A. Portable anemometer with collapsible rotors. 4,102,188, Cl. 73-170.00R.

Simko, Gabriel, to PPG Industries, Inc. Method of and apparatus for aligning a scoring wheel with a support wheel. 4,102,227, Cl. 83-7.000.

Simmat, Fritz: *See*—
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.

Simmons, Charles T.; and Lampert, William B., III, to Simmons, Charles T. Aromatic wood fuel briquette and method of making and using the same. 4,102,653, Cl. 44-16.00R.

Simon, Virgil S., to Thomas A. Schutz Co., Inc. Flip card display. 4,102,070, Cl. 40-498.000.

Simpkins, Peter Gerald: *See*—
Dudderar, Thomas Dixon; and Simpkins, Peter Gerald, 4,102,661, Cl. 65-2.000.

Simpson, Thomas Melvin. Machine for making a planter. 4,102,622, Cl. 425-268.000.

Sims, Rex J.: *See*—
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Sindermann, Siegmar: *See*—
Jordan, Heinrich; and Sindermann, Siegmar, 4,102,365, Cl. 141-39.000.

Singer Company, The: *See*—
Ferriss, Lincoln Stark, 4,102,202, Cl. 73-517.00B.
Naydan, Bob Nicholas; and Brand, Arnold Joseph, 4,103,215, Cl. 318-654.000.

Singhal, Subhash C.: *See*—
Lange, Frederick F.; and Singhal, Subhash C., 4,102,698, Cl. 106-65.000.

Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 3-(2,2,4,4-tetrafluoro-benz-1,3-dioxin-6-yl)-1-(substituted benzoyl)-ureas. 4,103,022, Cl. 424-278.000.

Siuta, Gerald Joseph; and Bernstein, Seymour, to American Cyanamid Company. Anionic phenylcarboxamide complement inhibitors. 4,102,918, Cl. 260-507.00R.

SKF Kugellagerfabriken GmbH: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Olschweski, Armin, 4,102,553, Cl. 308-6.00C.
Fischer, Wilhelm, 4,102,447, Cl. 192-110.00B.

Skutnik, Bolesh J.: *See*—
Bohm, Georg Gustav Anton; and Skutnik, Bolesh J., 4,102,761, Cl. 204-159.200.

Slater Electric Co.: *See*—
Jadatz, Harald B., 4,102,466, Cl. 220-3.800.

Slavnova, Alevtina Semenovna: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.

Sleeter, Ronald T. Quantitative analysis of carbohydrates by infrared spectroscopy. 4,102,646, Cl. 23-230.00R.

Sloan, Paul H., Jr., to Stant Manufacturing Company, Inc. O-rings for vehicle fuel tank filler neck caps. 4,102,472, Cl. 220-295.000.

Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, to South African Inventions Development Corporation. Process for the continuous manufacture of nitrous oxide. 4,102,986, Cl. 423-402.000.

Smith, Arthur V., Jr. System for collecting solar energy. 4,102,329, Cl. 126-271.000.

Smith, Donald C., to Sterling Associates, Inc. Label applying apparatus. 4,102,728, Cl. 156-362.000.

Smith International, Inc.: *See*—
Kellner, Jackson M., 4,102,552, Cl. 308-4.00A.
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., 4,102,411, Cl. 173-164.000.

Smith, James; and Johnston, Richard Paul, to General Electric Company. Multiple section rotor disc. 4,102,603, Cl. 416-244.00A.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Metallic carboxylate composition for forming thermoparticulating coating. 4,102,192, Cl. 73-339.00R.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Method for protecting electrical apparatus and thermal detection system using sulfonic acid thermoparticulating coating. 4,102,193, Cl. 73-339.00R.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Malonic acid composition for thermoparticulating coating. 4,102,809, Cl. 252-408.000.

Smith, John L.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.

Smith, Linda S.: *See*—
Harper, James H.; and Smith, Linda S., 4,102,562, Cl. 350-105.000.

Smith, Lynn C., to Design & Manufacturing Corporation. Door lock actuator unit. 4,102,213, Cl. 74-110.000.

Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, to Union Carbide Corporation. Compositions of high solids content comprising carboxylic polymer and aliphatic diepoxide. 4,102,942, Cl. 260-836.000.

Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 3-Thiazolidinyl heptanoic acids. 4,102,888, Cl. 260-294.80D.

Smith, Samuel C. Bridge scoring device. 4,102,543, Cl. 283-49.000.

Smith, William Allen: *See*—
Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,102,816, Cl. 252-428.000.

SmithKline Corporation: *See*—
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,103,086, Cl. 544-47.000.

Smock, Steve W.: *See*—
Homan, William N.; and Smock, Steve W., 4,103,119, Cl. 200-35.00R.

Snell, James B., to Phillips Petroleum Company. Liquid column chromatographic separation. 4,102,179, Cl. 73-61.10C.

Snipes, Thayer. Fuel burning control apparatus. 4,102,952, Cl. 261-44.00A.

Societe Anonyme de Recherche et d'Etudes Techniques: *See*—
Augier, Robert Joseph Ernest; and Eliche, Jean Marc, 4,102,618, Cl. 425-64.000.

S.A. des Cableries & Trefileries de Cossonay: *See*—
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Societe Anonyme dite: S I C O F: *See*—
Farge, Herve, 4,102,091, Cl. 52-79.700.

Societe Anonyme Francaise du Ferodo: *See*—
Rist, Michel, 4,102,446, Cl. 192-91.00A.

Societe Anonyme pour l'Equipement Electrique des Vehicules s.E.V. Marchal: *See*—
Rich, Bernard J., 4,102,040, Cl. 29-598.000.

Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.": *See*—
de la Roche Kerandraon, Olivier Geoffroy, 4,102,293, Cl. 115-28.00R.

Societe d'Exploitation de Brevets J.B.: *See*—
Hancu, Theodore, 4,102,003, Cl. 15-250.420.

Societe d'Exploitation des Cables Electriques: *See*—
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Societe Generale de Constructions Electriques et Meccaniques "Alsthom et Cie": *See*—
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,102,757, Cl. 204-73.00R.

Societe Internationale pour l'Innovation: *See*—
Moreno, Roland, 4,102,493, Cl. 235-419.000.

Societe Nationale des Poudres et Explosifs: *See*—
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.

Sofec, Inc.: *See*—
Dietrich, David S., 4,102,146, Cl. 61-110.000.

Sokoloff, Boris: *See*—
Picquendar, Jean-Edgar; and Sokoloff, Boris, 4,103,110, Cl. 179-15.0FD.

Sommer, John George: *See*—
Kuan, Tiong Ho; and Sommer, John George, 4,102,855, Cl. 260-42.330.

Sommer, Warren T. Central receiver solar collector using mechanically linked mirrors. 4,102,326, Cl. 126-270.000.

Sommers, Richard L.; and Sickler, Fred H., to Didde-Glaser, Inc. Numbering throw-off for collator. 4,102,264, Cl. 101-77.000.

Sonoi, Koya: *See*—
Nagano, Masashi; and Sonoi, Koya, 4,102,215, Cl. 74-243.0DR.

Sonomura, Roy N. Apparatus and method for placing explosives in submerged rock. 4,102,412, Cl. 175-5.000.

Sony Corporation: *See*—
Ikegami, Keisuke; and Hoshimi, Susumu, 4,103,197, Cl. 310-267.000.
Sugita, Kazuhiro; and Kon, Chiyohide, 4,103,232, Cl. 324-158.00F.

Sorensen, Keld Torben Schneider, to K. & V. Sorensen Engineering Ltd. Fluid pressure drill feeding device. 4,102,593, Cl. 408-130.000.

Soto, Ricardo Hurtado. Disposable resealable container. 4,102,487, Cl. 229-54.00R.

South African Inventions Development Corporation: *See—*
Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, 4,102,986, Cl. 423-402.000.

Soyland, Ingebret. Excavator with low center of gravity. 4,102,461, Cl. 214-132.000.

Spampinato, Dominic Patrick: *See—*
Miersch, Ekkehard Fritz; and Spampinato, Dominic Patrick, 4,103,342, Cl. 365-149.000.

Spanier, Henry C.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.

Speaker, Richard L.: *See—*
Wolbrink, David W.; and Speaker, Richard L., 4,102,448, Cl. 198-365.000.

Speakman Company: *See—*
Lagarelli, Carmen J., 4,101,989, Cl. 4-191.000.

Speizman Industries, Inc.: *See—*
Annas, Dulin Land, Sr., 4,102,729, Cl. 156-384.000.

Speranza, George P.; and Waddill, Harold G., to Texaco Development Corporation. Method of making glycidyl ethers of novolak resins. 4,102,866, Cl. 528-135.000.

Sperry, Peter Reeves; Wiersema, Richard J.; and Nyi, Kayson, to Rohm and Haas Company. Dispersing paint pigments. 4,102,843, Cl. 260-29.6RW.

Sperry Rand Corporation: *See—*
Hyman, Charles E.; and Setter, Alfred C., 4,103,325, Cl. 363-148.000.

Spevack, Jerome S., to Deuterium Corporation. Process feed and effluent treatment systems. 4,102,650, Cl. 23-270.50W.

Spicer, John F.: *See—*
Amberg, Stephen W.; and Spicer, John F., 4,102,302, Cl. 118-239.000.

Spirin, Evgeny Timofeevich: *See—*
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Spitz, George T.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.

Spollen, Francis Joseph, to Bell Telephone Laboratories, Incorporated. Anchor assembly for a submarine cable coupling. 4,103,104, Cl. 174-70.00S.

Spotholz, Clifford H.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Spottiswoode, Nigel Lawrence; and Ryden, David John, to AGA Navigation Aids Ltd. Nuclear light source. 4,103,172, Cl. 250-462.000.

Spound, Albert M.; and Horowitz, Richard D. Adjustable modular bookcase. 4,102,275, Cl. 108-92.000.

Spradlin, Richard V. Portable medical table. 4,103,170, Cl. 250-451.000.

Spradling, Gene V., to Emerson Electric Co. Two speed single phase induction motor. 4,103,212, Cl. 318-224.00A.

Sprecher & Schuh Ltd. (SSA): *See—*
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.

Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. Flavoring with derivatives of 1-acetyl-3,3-dimethylcyclohexane, and processes for using same and processes for preparing said 1-acetyl-3,3-dimethylcyclohexane derivatives. 4,103,036, Cl. 426-538.000.

Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.

Staats, Henry N., to General Binding Corporation. Two stage oven laminator. 4,102,730, Cl. 156-499.000.

Stackpole Carbon Company: *See—*
Borkowski, John W., 4,102,960, Cl. 264-42.000.

Stagoll, Francis: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Stahl, Howard D.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Stalherm, Dieter; and Kolitz, Volker, to Bergwerksverband GmbH. Coke oven battery with control means for changing the heat supply. 4,102,751, Cl. 202-151.000.

Stalling, David L.; Huckins, James N.; and Smith, William Allen, to United States of America, Interior. Adsorbent for polynuclear aromatic compounds. 4,102,816, Cl. 252-428.000.

Standard Brands Incorporated: *See—*
Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., 4,102,745, Cl. 195-31.00R.

Standard Oil Company, The: *See—*
Budinger, Bruce O.; and Duke, June T., 4,102,947, Cl. 260-879.000.

Standard Oil Company (Indiana): *See—*
Hensley, Albert L., Jr., 4,102,779, Cl. 208-211.000.
Vitali, Joseph D., 4,103,335, Cl. 364-900.000.

Stant Manufacturing Company, Inc.: *See—*
Sloan, Paul H., Jr., 4,102,472, Cl. 220-295.000.

Staroselsky, Naum: *See—*
Rutshtein, Alexander; and Staroselsky, Naum, 4,102,604, Cl. 417-19.000.

Stauffer Chemical Company: *See—*
Giolito, Silvio L.; and Mirviss, Stanley B., 4,103,096, Cl. 568-783.000.
Thomas, Victor M., Jr., 4,103,033, Cl. 424-343.000.

Stauffer, Norman L., to Honeywell Inc. Distance determining and automatic focusing apparatus with false peak discrimination. 4,103,152, Cl. 250-204.000.

Steadley Company, Inc.: *See—*
Yates, Chester Robert; and Hall, Guy E., 4,101,993, Cl. 5-267.000.

Steele Chemicals Co. Ltd.: *See—*
Kruger, Gunther, 4,102,883, Cl. 260-239.55R.
Kruger, Gunther, 4,102,884, Cl. 260-239.570.

Steele, George E.: *See—*
Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., 4,102,149, Cl. 62-196.00A.

Stegelman, Albert F., to Phillips Fibers Corporation. Yarn supply package and method and apparatus for the winding thereof. 4,102,508, Cl. 242-18.0PW.

Steidinger, Donald J., to Wallace Business Forms, Inc. Method of making a continuous envelope. 4,102,251, Cl. 93-63.00M.

Steinbach, Carl Raymond: *See—*
D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.

Steinberg, Richard W., to Vibra-King, Inc. Subsoiler. 4,102,402, Cl. 172-40.000.

Steinberg, Richard W., to Vibra-King, Inc. Apparatus for making a slit trench. 4,102,403, Cl. 172-40.000.

Steinke, John F.: *See—*
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., 4,102,411, Cl. 173-164.000.

Stendel, Wilhelm: *See—*
Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.

Stepan, Walter; and Hennecke, Klaus, to UVEX Winter Optik GmbH. Protective device having a shield for protecting the face of a user. 4,101,980, Cl. 2-9.000.

Stephanides, Viktor: *See—*
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.

Stephens, Berton H., to Dynatel Corporation. System and method for determining capacitance and cable length in the presence of other circuit elements. 4,103,225, Cl. 324-60.0CD.

Stephenson, Richard M., to PPG Industries, Inc. Distillation of metachloronitrobenzene in the presence of a distillation adjuvant. 4,102,753, Cl. 203-64.000.

Sterling Associates, Inc.: *See—*
Smith, Donald C., 4,102,728, Cl. 156-362.000.

Sterling Drug Inc.: *See—*
Jefferies, Patrick J.; and Crounse, Nathan N., 4,103,092, Cl. 260-175.000.

Stern, Leif E., to Nederman, Bill Peter Philip. Particle suction systems. 4,102,083, Cl. 51-170.00R.

Sterne, Jean-Jacques, to Aron S.A.R.L. (3-Piperazinocarbonyliminoquanidino)-isoxazoles. 4,103,010, Cl. 424-250.000.

Stettner, Joseph C.; and Ott, James H., to Novar Electronics Corporation. Intruder deterrent apparatus and method. 4,103,294, Cl. 340-566.000.

Stewart, William James, to Plessey Handel und Investments A.G. Optical apparatus. 4,102,579, Cl. 356-201.000.

Stiff, John E. Solar heating and control system. 4,102,328, Cl. 126-271.000.

Still Water Properties, N.V.: *See—*
Tyler, Nelson, 4,101,997, Cl. 9-310.00A.

Stock, Alvin L.; Roddis, Gravatt K.; and Nygren, William C., to Westinghouse Electric Corp. Single case low pressure turbine. 4,102,598, Cl. 415-135.000.

Stockholm, John George: *See—*
Cordier, Andre Guy; and Stockholm, John George, 4,102,303, Cl. 118-326.000.

Stone, Richard D., to UOP Inc. Moving bed contacting process. 4,102,776, Cl. 208-64.000.

Storz, Karl. Head mounted lamp with joint observation eyepiece. 4,102,333, Cl. 128-6.000.

Stover, David Emmert; and Menzel, Alvin Lewis, to Deere & Company. Non-Jamming shear pin assembly. 4,102,153, Cl. 64-28.00R.

Straka, Daniel Charles, to Arco Polymers, Inc. Latex frothing agent. 4,102,808, Cl. 252-354.000.

Strandine, Eldon J.; and Koonz, Carl H., to Swift & Company. Apparatus for injecting a liquid additive into poultry flesh. 4,102,258, Cl. 99-532.000.

Strawson, Colin John: *See—*
Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, 4,103,023, Cl. 424-279.000.

Street, Vern A.: *See—*
Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., 4,102,627, Cl. 431-16.000.

Stricklin, Harry Charles. Converting an internal combustion engine to a single acting engine driven by steam or compressed air. 4,102,130, Cl. 60-407.000.

Strobel, Gary Rudolph: *See—*
Gothard, David Olen; and Strobel, Gary Rudolph, 4,102,678, Cl. 427-191.000.

Strom, Gerald A.; and Bernard, James I., to Schlumberger Technology

Corporation. Measuring-while-drilling system having motor speed detection during encoding. 4,103,281, Cl. 340-18.0LD.
Structural Instrumentation, Inc.: *See—*
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., 4,102,031, Cl. 29-464.000.
Stulgate, Emily M.: *See—*
Aberson, Gerhard M.; and Stulgate, Emily M., 4,103,062, Cl. 428-283.000.
Sturrock, John Monro; and Wallman, Bernard Allan, to Cambridge Scientific Instruments Limited. Electron beam microfabrication apparatus. 4,103,168, Cl. 250-442.000.
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, to Societe Nationale des Poudres et Explosifs. Diol-phosphonates as flame-retardants in polyurethane foam. 4,102,830, Cl. 521-165.000.
Stut, Hans: *See—*
Dietze, Wolfgang; and Stut, Hans, 4,102,298, Cl. 118-5.000.
Suami, Tetsuo. Aminocyclitol derivatives and process for producing the same. 4,103,082, Cl. 536-17.000.
Suess, Frank A.: *See—*
Suess, Richard R.; and Suess, Frank A., 4,102,237, Cl. 84-421.000.
Suess, Richard R.; and Suess, Frank A., to Suess, Richard R. Stand for an assembly of musical drums. 4,102,237, Cl. 84-421.000.
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of alkali aluminosilicate detergent builder. 4,102,977, Cl. 423-118.000.
Sugerman, Gerald: *See—*
Monte, Salvatore J.; and Sugerman, Gerald, 4,102,862, Cl. 528-88.000.
Sugita, Kazuhiro; and Kon, Chiyohide, to Sony Corporation. Wafer transfer device. 4,103,232, Cl. 324-158.00F.
Sugiyama, Masatoshi; Sawaguchi, Hirosi; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Methine dyes. 4,102,688, Cl. 96-139.000.
Sulzer Brothers Ltd.: *See—*
Pfeiffer, Hans Jorg; Rene, Keller; and Erich, Frank, 4,102,705, Cl. 127-37.000.
Sumitomo Chemical Company, Limited: *See—*
Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,102,842, Cl. 260-29.6PT.
Fukuba, Kozo; Ogushi, Yasutomo; and Harada, Haruhisa, 4,102,697, Cl. 106-111.000.
Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, 4,102,944, Cl. 260-861.000.
Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
Sumitomo Metal Industries, Ltd.: *See—*
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.
Nakamura, Masahiro; Tsuda, Tetsuaki; and Amakata, Hajime, 4,102,772, Cl. 204-206.000.
Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, 4,102,694, Cl. 106-56.000.
Yamauchi, Nobuyuki; and Taka, Takao, 4,103,143, Cl. 219-145.210.
Summers, John J.; and Willis, Larry G., to National Gypsum Company. Two-way window grid. 4,103,052, Cl. 428-38.000.
Sumrall, James A.: *See—*
Holder, Charles B., 4,102,380, Cl. 157-1.260.
Sun, Jack Ji-Nong; and Lewis, Dartrey, to S. G. Frantz Company, Inc. Method and apparatus for magnetic separation of particles in a fluid carrier. 4,102,780, Cl. 209-39.000.
Sun, Jui-Yuan: *See—*
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.
Sun Oil Company Limited: *See—*
Berry, Holland James; and Morgan, George W., 4,102,288, Cl. 114-41.000.
Sundstrand Corporation: *See—*
Edman, Hans Per Reinhold, 4,102,630, Cl. 431-29.000.
Huber, Melvin F.; and Hansen, Lowell D., 4,102,606, Cl. 417-204.000.
Reynolds, David W.; and Pollman, Frederic W., 4,102,131, Cl. 60-431.000.
Sushradt, Wolfgang: *See—*
Wiendahl, Joachim; Jendrichowski, Klaus; and Sushradt, Wolfgang, 4,102,351, Cl. 134-129.000.
Suzuki, Kiyoshi: *See—*
Suzuki, Masane; and Suzuki, Kiyoshi, 4,102,577, Cl. 356-169.000.
Suzuki, Masane; and Suzuki, Kiyoshi, 4,102,578, Cl. 356-120.000.
Suzuki, Masane; and Suzuki, Kiyoshi, to Fuji Photo Optical Co., Ltd. Method of forming moire contour lines. 4,102,577, Cl. 356-169.000.
Suzuki, Masane; and Suzuki, Kiyoshi, to Fuji Photo Optical Co., Ltd. Method of and apparatus for recording surface irregularity of object. 4,102,578, Cl. 356-120.000.
Suzuki, Takao: *See—*
Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, 4,102,694, Cl. 106-56.000.
Suzuki, Yasoji; and Kuroda, Tadashi, to Tokyo Shibaura Electric Co., Ltd. Frequency divider with one-phase clock pulse generating circuit. 4,103,184, Cl. 307-225.00C.
Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor memory with data detection circuit. 4,103,345, Cl. 365-190.000.
Swager, William E. Locking clevis or the like. 4,102,124, Cl. 59-86.000.
Swanson, Roy T.: *See—*
Jarosz, John M.; and Swanson, Roy T., 4,103,120, Cl. 200-48.00R.
Rogers, Edward J.; and Swanson, Roy T., 4,103,121, Cl. 200-48.00A.
Swift & Company: *See—*
Strandine, Eldon J.; and Koonz, Carl H., 4,102,258, Cl. 99-532.000.
Swift, Harold E.: *See—*
Beuther, Harold; Innes, Robert A.; and Swift, Harold E., 4,102,914, Cl. 260-465.300.
Swinehart, Merle R., to Cutler-Hammer, Inc. Two-wire pilot device solid state control system. 4,103,299, Cl. 340-506.000.
Sylvester, Bruce J.; and Sylvester, Roger P., to J. G. Sylvester Associates, Inc. Underwater inspection and communication apparatus. 4,102,203, Cl. 73-620.000.
Sylvester, Roger P.: *See—*
Sylvester, Bruce J.; and Sylvester, Roger P., 4,102,203, Cl. 73-620.000.
Syminex: *See—*
Kermabon, Andre J., 4,103,158, Cl. 250-269.000.
Symons Corporation: *See—*
Cody, David L., 4,102,096, Cl. 52-122.000.
Cody, David L., 4,102,108, Cl. 52-693.000.
Synanon Foundation, Inc.: *See—*
Bergman, Jay Richard, 4,103,118, Cl. 179-170.00D.
Synthes AG: *See—*
Weber, Bernhard Georg; and Flury, Beat, 4,102,339, Cl. 128-92.00E.
Szabo, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
Szabo, Thomas L.: *See—*
Frost, Harold M.; and Szabo, Thomas L., 4,102,207, Cl. 73-643.000.
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of benzo(a)quinolizidine derivatives. 4,102,886, Cl. 260-287.0CF.
Szecska, Dezso: *See—*
Danszky, Istvan; and Szecska, Dezso, 4,102,407, Cl. 172-611.000.
Szekely, Zoltan: *See—*
Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, 4,102,181, Cl. 73-119.00A.
Szewczyk, Andrew J.: *See—*
Bistrick, Eugene J.; Abrahamsson, Axel B.; Szewczyk, Andrew J.; McCabe, Frank A.; Schlaf, Richard A.; and Gabriele, Leonard A., 4,102,244, Cl. 90-1.000.
Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,102,119, Cl. 58-23.00R.
Tabler, Donald C.: *See—*
Johnson, Marvin M.; and Tabler, Donald C., 4,102,802, Cl. 252-184.000.
Taboada, John; and Lindsey, Marvin H. Constant volume seal-free reciprocating pump. 4,102,610, Cl. 417-417.000.
Tada, Shinichi: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.
Taichiro Akiyama: *See—*
Akiyama, Taichiro; Ookubo, Sajiro; and Ueno, Setsuko, 4,102,342, Cl. 128-325.000.
Taka, Takao: *See—*
Yamauchi, Nobuyuki; and Taka, Takao, 4,103,143, Cl. 219-145.210.
Takahashi, Keikichi: *See—*
Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, 4,102,123, Cl. 58-140.00R.
Takahashi, Kenji: *See—*
Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, 4,102,675, Cl. 75-24.000.
Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, to Kubota Ltd. Seated-operator type tractor. 4,102,537, Cl. 296-102.000.
Takahiro, Yamamoto: *See—*
Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, 4,103,224, Cl. 324-58.50C.
Takase, Yoshiyuki: *See—*
Minami, Shinsaku; and Takase, Yoshiyuki, 4,103,011, Cl. 424-251.000.
Takeda Chemical Industries, Ltd.: *See—*
Kondo, Sadao; and Nakano, Hidehiko, 4,102,806, Cl. 252-316.000.
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 4,102,881, Cl. 260-239.0BD.
Takei, Kensuke: *See—*
Majima, Kanji; Takei, Kensuke; and Tsutoo, Keiichi, 4,102,911, Cl. 260-458.00R.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; and Takeuchi, Tomio, 4,102,999, Cl. 424-123.000.
Takimoto, Yasuyuki; and Yoshikawa, Toshikazu, to Nippon Paint Company. Duplicate thermoplastic plates, matrices useful therefor and methods of manufacturing the same. 4,103,057, Cl. 428-156.000.
Takizawa, Shiro; and Nishimura, Shinichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Slit lamp microscope. 4,102,565, Cl. 351-14.000.
Talati, Kirit: *See—*
Robinson, Michael; Mobbs, David Barry; and Talati, Kirit, 4,102,812, Cl. 252-421.000.
Talbert, Miles E., to Thomasville Products, Inc. Apparatus for produc-

ing polyurethane foam buns of varying heights. 4,102,621, Cl. 425-224.000.
Taller, Robert Arthur: *See—*
Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, 4,102,942, Cl. 260-836.000.
Tally Corporation: *See—*
Hayes, Carlos F., 4,103,216, Cl. 318-685.000.
Tamura, Hiroshi: *See—*
Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, 4,102,696, Cl. 106-73.200.
Tamura, Masaru: *See—*
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,102,824, Cl. 252-545.000.
Tan, Yoichi, to Nippon Electric Co., Ltd. FSK demodulator. 4,103,244, Cl. 329-122.000.
Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,102,122, Cl. 58-58.000.
Tanaka, Shigenori; and Tojo, Akio, to Nissan Motor Company, Ltd. Fluid supplying and discharging apparatus for shuttleless weaving loom. 4,102,361, Cl. 139-435.000.
Tanaka, Yutaka: *See—*
Ikuno, Yuzi; and Tanaka, Yutaka, 4,102,341, Cl. 128-303.140.
Tani Denki Kogyo Kabushiki Kaisha: *See—*
Akiyama, Masaki; and Tani, Okie, 4,103,105, Cl. 179-1.0VC.
Tani, Okie: *See—*
Akiyama, Masaki; and Tani, Okie, 4,103,105, Cl. 179-1.0VC.
Tanigaki, Yasushi: *See—*
Hayamizu, Mamoru; and Tanigaki, Yasushi, 4,102,571, Cl. 356-1.000.
Taniguchi, Toru, to Nikku Industry Co., Ltd.; and Nippon Carbon Co., Ltd. Method of impregnating carbon electrodes. 4,103,046, Cl. 427-113.000.
Tappan Company, The: *See—*
Perl, Richard L., 4,102,496, Cl. 236-48.00R.
Taradash, Allen: *See—*
Barbush, Joseph F., 4,102,164, Cl. 70-241.000.
Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, to TDK Electronics Co., Ltd. Micro-wave hygrometer. 4,103,224, Cl. 324-58.50C.
Tarrant, Fred A. Combined greeting card and music box structure. 4,102,067, Cl. 40-455.000.
Tarrone, Eugenio. Welding mask with automatic obscuring of the visual field. 4,101,979, Cl. 2-8.000.
Tarukawa, Hideaki: *See—*
Tarukawa, Tomiji; and Tarukawa, Hideaki, 4,102,972, Cl. 264-256.000.
Tarukawa, Tomiji; and Tarukawa, Hideaki. Refractory pipe fittings and production thereof. 4,102,972, Cl. 264-256.000.
Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, to Kabushiki Kaisha Daini Seikosha. Bearing for a timepiece train. 4,102,123, Cl. 58-140.00R.
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, to Takeda Chemical Industries, Ltd. Benzodiazepine derivatives. 4,102,881, Cl. 260-239.0BD.
Taylor, Challen E., to Goodyear Tire & Rubber Company, The. Method of making a hose having an improved surface appearance. 4,102,724, Cl. 156-149.000.
Taylor, Donald M.; and Ward, Donald H., to Armco Steel Corporation. Interlocked channel section panels and connectors therefor. 4,102,105, Cl. 52-520.000.
Taylor, Harold Mellon, to Eli Lilly and Company. Herbicidal beta-phenyl-4-piperidinones and -dihydropyridinones. 4,102,669, Cl. 71-94.000.
Taylor, John Crawshaw; and Phillips, Richard Antony. Thermostats. 4,103,271, Cl. 337-372.000.
Taylor, Lloyd D., to Polaroid Corporation. Photographic uses of polyvinylphenylmercapto-tetrazole:multivalent metal cation combinations. 4,102,685, Cl. 96-73.000.
TDK Electronics Co., Ltd.: *See—*
Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, 4,103,224, Cl. 324-58.50C.
Te, Ljudmila Ilinichna: *See—*
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
Teijin Limited: *See—*
Kawamura, Takeo; Saiki, Noritsugu; Nakamura, Yoshitugu; and Tokashiki, Michiyuki, 4,102,853, Cl. 260-40.00R.
Teizo Sakai: *See—*
Itayama, Shinichi, 4,102,596, Cl. 415-101.000.
Itayama, Shinichi, 4,102,597, Cl. 415-101.000.
Telefonaktiebolaget L M Ericsson: *See—*
Linden, Lars Kalle; and Persson, Kjell Stellan, 4,103,149, Cl. 235-92.0TE.
Telub AB: *See—*
Christiansson, Per Lennart, 4,102,422, Cl. 177-210.00C.
Tenbergen, Reichel A., to International Nickel Company, Inc., The. Flotation process. 4,102,781, Cl. 209-166.000.
Tenneco, Inc.: *See—*
Wilson, George T., 4,102,430, Cl. 181-265.000.
Terrell, William: *See—*
Grayzel, Joseph; and Terrell, William, 4,102,331, Cl. 128-2.10E.
Terry, Ruel C., to In Situ Technology, Inc. Sealing an underground coal deposit for in situ production. 4,102,397, Cl. 166-259.000.
Tessenderlo Chemie S.A.: *See—*
Peerts, Fernand; and Delaunois, Yvon, 4,102,874, Cl. 528-387.000.
Texaco Development Corporation: *See—*
Brennan, Michael E., 4,103,087, Cl. 544-78.000.
Cavitt, Stanley B., 4,102,820, Cl. 252-463.000.
Klein, Howard P., 4,102,828, Cl. 521-174.000.
Speranza, George P.; and Waddill, Harold G., 4,102,866, Cl. 528-135.000.
Texaco Inc.: *See—*
Dowling, Donald J.; and Arnold, Dan M., 4,102,185, Cl. 73-155.000.
Harnsberger, Bobby G., 4,102,398, Cl. 166-276.000.
Harnsberger, Bobby G., 4,102,399, Cl. 166-276.000.
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,102,749, Cl. 201-2.500.
Texas Instruments Incorporated: *See—*
Barton, James Brockman, 4,103,347, Cl. 365-219.000.
Thacker, Charles P., to Xerox Corporation. Task handling in a data processing apparatus. 4,103,330, Cl. 364-200.000.
Thacker, Charles P., to Xerox Corporation. Data processing display system. 4,103,331, Cl. 364-200.000.
Thaler, Richard: *See—*
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.
Thaler, Warren A., to Exxon Research & Engineering Co. Halogenated organoaluminum compounds and method of preparation. 4,103,079, Cl. 526-185.000.
Thenander, Rune, to ASEA Aktiebolag. Method of minimizing errors in measuring of tension in moving strip. 4,102,183, Cl. 73-144.000.
Thiel, Frank L.: *See—*
Hawk, Robert M.; and Thiel, Frank L., 4,102,561, Cl. 350-96.210.
Thiem, Karl-Werner: *See—*
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,102,906, Cl. 260-382.000.
Thom, Karl-Friedrich; Maass, Gunther; and Beck, Manfred, to Bayer Aktiengesellschaft. Working up polysiloxane/polycarbonate copolymers. 4,102,940, Cl. 260-824.00R.
Thomas A. Schutz Co., Inc.: *See—*
Simon, Virgil S., 4,102,070, Cl. 40-498.000.
Thomas, David Hamilton, to Imperial Chemical Industries Limited. Unsaturated polyester resin composition comprising polypropylene adipate. 4,102,837, Cl. 260-22.0CB.
Thomas, Klaus: *See—*
Ost, Walter; Thomas, Klaus; and Prokic-Immel, Ricarda, 4,102,910, Cl. 260-453.0RW.
Thomas, Lazarus D., to Libbey-Owens-Ford Company. Removing iridescent stains from vitreous surfaces. 4,102,706, Cl. 134-3.000.
Thomas, Victor M., Jr., to Stauffer Chemical Company. Method of controlling insects. 4,103,033, Cl. 424-343.000.
Thomason, Harry E. Solar heating (cooling) system. 4,102,327, Cl. 126-271.000.
Thomasson, Frederick Young, to Babcock & Wilcox Company, The. Composite transducer. 4,103,161, Cl. 250-336.000.
Thomasville Products, Inc.: *See—*
Talbert, Miles E., 4,102,621, Cl. 425-224.000.
Thompson, David Allen: *See—*
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
Thompson, Edwin R., to Forox Corporation. Method for loading film transparencies into slide mounts. 4,102,029, Cl. 29-417.000.
Thompson, Gerald Price. Lighting device. 4,103,322, Cl. 362-101.000.
Thompson, John H.; Kowalyshyn, Stephen; and Nelkin, Arthur, to Westinghouse Electric Corp. Hot spot temperature sensor. 4,102,195, Cl. 73-340.000.
Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., to Standard Brands Incorporated. Process for producing dextrose using mixed immobilized enzymes. 4,102,745, Cl. 195-31.00R.
Thompson, Morice William: *See—*
Bentley, John; and Thompson, Morice William, 4,102,846, Cl. 260-31.20N.
Thompson, Wallace M.; and Beeland, William D., to American Hoist & Derrick Company. Vertical closed chamber baler. 4,102,259, Cl. 100-3.000.
Thomson-CSF: *See—*
Chevalier, Michel; Lucas, Jean-Claude; and Lacoste, Gerard, 4,103,218, Cl. 323-1.000.
d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, 4,103,154, Cl. 250-227.000.
Espaignol, Jacques; and Klein, Edmond, 4,102,037, Cl. 29-583.000.
Gendreu, Robert; and Chabah, Maurice, 4,103,300, Cl. 343-6.00R.
Moreau, Jean Michel, 4,103,181, Cl. 361-86.000.
Picquendar, Jean-Edgar; and Sokoloff, Boris, 4,103,110, Cl. 179-15.0FD.
Poirier, Raymond; Hubert, Yves; and Lakhoua, Noureddine, 4,103,333, Cl. 364-824.000.
Throckmorton, Morford C.; and Saltman, William M., to Goodyear Tire & Rubber Company, The. Catalyst composition for the preparation of butadiene. 4,102,817, Cl. 252-429.00B.
Thummel, David L.: *See—*
Floyd, Robert D.; Gorman, Lee V.; and Thummel, David L., 4,103,332, Cl. 364-449.000.

Thurner, Elmar, to Hilti Aktiengesellschaft. Anchoring assembly fastenable by an explosive powder driven setting tool. 4,102,238, Cl. 85-10.00E.
Tiegel, Eric G., to Tiegel Manufacturing Company. Apparatus for burning together lead storage battery posts and high profile bushings. 4,102,638, Cl. 432-229.000.
Tiegel Manufacturing Company: *See*—
Tiegel, Eric G., 4,102,638, Cl. 432-229.000.
Timmermans, Armand; Selleslagh, Eduard; and Deneyer, Jose N. E., to Verenigde Energiebedrijven van het Scheldeland. Installation for the measuring of an essentially linear displacement. 4,103,233, Cl. 324-208.000.
Timmler, Helmut; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. 1-(2-Halogeno-2-phenyl-ethyl)-triazoles. 4,102,891, Cl. 260-308.00R.
Timmons, Jay, to Hiebert, Inc. Drawer file folder stop. 4,102,470, Cl. 220-22.300.
Tirilly, Roger: *See*—
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.
Tjukov, Boris Alexeevich: *See*—
Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich, 4,102,016, Cl. 19-159.00R.
Tobias, Michael Allan; and Lynch, Conrad Linden, to Mobil Oil Corporation. Fast-curing coating compositions. 4,102,869, Cl. 427-178.000.
Tobolski, Thaddeus. Folding work table apparatus. 4,102,555, Cl. 312-240.000.
Tojo, Akio, to Nissan Motor Company, Ltd. Shuttleless loom. 4,102,362, Cl. 139-435.000.
Tojo, Akio: *See*—
Tanaka, Shigenori; and Tojo, Akio, 4,102,361, Cl. 139-435.000.
Tokashiki, Michiyuki: *See*—
Kawamura, Takeo; Saiki, Noritsugu; Nakamura, Yoshitugu; and Tokashiki, Michiyuki, 4,102,853, Cl. 260-40.00R.
Toke, Laszlo: *See*—
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
Tokico Ltd.: *See*—
Nagase, Toshiro, 4,102,004, Cl. 16-49.000.
Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, to Kimmon Electric Co., Ltd., The. Metal vapor laser generating apparatus. 4,103,253, Cl. 331-94.50G.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Takizawa, Shiro; and Nishimura, Shinichi, 4,102,565, Cl. 351-14.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Idei, Gijun, 4,103,248, Cl. 330-288.000.
Kato, Taketoshi; Uchida, Masato; and Goto, Kenichi, 4,102,732, Cl. 156-645.000.
Suzuki, Yasoji; and Kuroda, Tadashi, 4,103,184, Cl. 307-225.00C.
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,103,345, Cl. 365-190.000.
Tomczak, Lawrence William: *See*—
Crall, Frederick William; Tomczak, Lawrence William; and Caron, LaVerne Andrew, 4,102,311, Cl. 123-117.00R.
Tomono, Kunisabro: *See*—
Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, 4,102,696, Cl. 106-73.200.
Tonoike, Kiyoshi: *See*—
Nishida, Takao; and Tonoike, Kiyoshi, 4,103,049, Cl. 427-341.000.
Toray Industries, Inc.. *See*—
Okamoto, Miyoshi; and Yoshida, Syusuke, 4,103,054, Cl. 428-91.000.
Toro Company, The: *See*—
Estes, Larry A.; and Williams, Gerald D., 4,102,114, Cl. 56-15.200.
Torossian, Kevork A.; and Lynn, Alexander L., to General Electric Company. Bonded laminations forming a stator core. 4,103,195, Cl. 310-259.000.
Toshiyasu, Ishimaru; Minoru, Hatanaka; Mariko, Hatamura; and Hazime, Nitta. 7[2(2,3 Dioxopiperazin-1-yl-carbonylamino)substituted 2 phenylacetamido]-3-2'-thiadiazolyl cephalosporanic acid derivatives. 4,103,008, Cl. 424-246.000.
Total Raffinaderij Nederland N.V.: *See*—
Roelse, Adriaan; and van der Ley, Barteld Hendrik, 4,102,647, Cl. 23-232.00R.
Toth, Istvan: *See*—
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
Tournut, Claude: *See*—
Duperray, Gilbert; Monnet, Andre; and Tournut, Claude, 4,102,966, Cl. 264-112.000.
Towmotor Corporation: *See*—
Palmer, Norman H. G., 4,102,132, Cl. 60-433.000.
Sabec, Charles J., 4,102,427, Cl. 180-156.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Imura, Shinichi; Saito, Mitsutaka; and Morishita, Nobuo, 4,102,946, Cl. 260-878.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kato, Kazuo, 4,102,617, Cl. 418-142.000.
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,102,813, Cl. 252-430.000.
Miyagi, Hideo, 4,102,126, Cl. 60-276.000.
Naka, Mitsuru; and Sakamoto, Masao, 4,102,218, Cl. 74-493.000.
Nogami, Tomoyuki; and Ohta, Takaaki, 4,102,551, Cl. 303-24.00A.
Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.
Sashihara, Kenji; and Masuda, Takao, 4,102,312, Cl. 96-114.100.
Travnicek, Edward A.: *See*—
Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., 4,102,567, Cl. 351-160.000.
Treis, Wolfgang: *See*—
Hartmann, Karl; and Treis, Wolfgang, 4,102,648, Cl. 23-254.0EF.
Tri-Century Industries, Inc.: *See*—
La Forge, Louis H., Jr., 4,103,293, Cl. 340-514.000.
Trine, John A.; and Braun, David L., to Minnesota Mining and Manufacturing Company. Vapor sampling and analytical device. 4,102,201, Cl. 73-421.50R.
Trio Kabushiki Kaisha: *See*—
Morinaga, Mistuyoshi, 4,103,117, Cl. 179-100.41Z.
Sekiguchi, Tadao, 4,103,290, Cl. 340-168.00B.
Triplex Safety Glass Company Limited: *See*—
Kearin, Martin John; Hiscutt, Robert; and Molineux, Peter, 4,102,768, Cl. 204-192.00P.
Trivette, Chester D., Jr.: *See*—
Genetti, Ralph A.; and Trivette, Chester D., Jr., 4,102,868, Cl. 260-858.000.
Trofilkina, Valentina Petrovna: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.
TRW Inc.: *See*—
Herbenar, Edward John, 4,102,585, Cl. 403-138.000.
Tsilibes, George N.: *See*—
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., 4,102,681, Cl. 96-1.400.
Tsipouras, Panayiotis J., to Megasystems, Inc. RTD measurement system. 4,102,199, Cl. 73-362.0AR.
Tsuda, Tetsuaki: *See*—
Nakamura, Masahiro; Tsuda, Tetsuaki; and Amakata, Hajime, 4,102,772, Cl. 204-206.000.
Tsuji, Kozo: *See*—
Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,102,842, Cl. 260-29.6PT.
Tsukada, Nobuo: *See*—
Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, 4,102,123, Cl. 58-140.00R.
Tsumura, Kazuo: *See*—
Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.
Tsunekawa, Tokuichi: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.
Tsuruoka, Takashi: *See*—
Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
Tsutoo, Keiichi: *See*—
Majima, Kanji; Takei, Kensuke; and Tsutoo, Keiichi, 4,102,911, Cl. 260-458.00R.
Tuffile, Fred M.; and Cunningham, Andrew J., to Avon Products, Inc. Method of dyeing human hair with reactive dyes. 4,102,641, Cl. 8-10.100.
Tuhy, Ivan E.: *See*—
Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., 4,102,270, Cl. 102-49.500.
Tulco, Inc.: *See*—
Tully, Paul Raymond, 4,102,703, Cl. 106-287.140.
Tully, Paul Raymond, to Tulco, Inc. Water-repellent coating compositions and method for their preparation. 4,102,703, Cl. 106-287.140.
Turley, Barry Jay: *See*—
Gardner, Alvin Leonard; and Turley, Barry Jay, 4,103,211, Cl. 318-87.000.
Turner, C. Warren: *See*—
Cage, Kenneth M.; and Turner, C. Warren, 4,102,232, Cl. 83-854.000.
Turri, Eugenio: *See*—
Gandini, Giuseppe; and Frignoli, Luigi, 4,102,794, Cl. 252-8.100.
Tyler, Nelson, to Still Water Properties, N.V. Water ski for power driven water vehicle. 4,101,997, Cl. 9-310.00A.
Uchida, Kiyoshi: *See*—
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,102,813, Cl. 252-430.000.
Uchida, Masato: *See*—
Kato, Taketoshi; Uchida, Masato; and Goto, Kenichi, 4,102,732, Cl. 156-645.000.
Uebayashi, Toshiaki: *See*—
Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.
Ueda, Fusao: *See*—
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.

Ueda, Yuichi: *See—*
Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
Uemlianin, Andray: *See—*
Hawkes, David A.; Robson, Alan L.; and Uemlianin, Andray, 4,102,530, Cl. 266-46.000.
Ueno, Setsuko: *See—*
Akiyama, Taichiro; Ookubo, Sajiro; and Ueno, Setsuko, 4,102,342, Cl. 128-325.000.
Uesugi, Masaaki: *See—*
Okada, Hiroo; Hirota, Moriyuki; and Uesugi, Masaaki, 4,102,786, Cl. 210-80.000.
Ueyama, Fumio; and Hattori, Tadashi, to Osaka Denki Co., Ltd. Method for feeding a welding wire. 4,102,483, Cl. 228-244.000.
Uhlig, Raimer: *See—*
Herb, Armin; Leibhard, Erich; and Uhlig, Raimer, 4,102,587, Cl. 403-205.000.
Ulam, John B., to Clad Metals, Inc. Clad metal product of Cu, Al and stainless steel. 4,103,076, Cl. 428-653.000.
Ulff, Carl Bengt Johan: *See—*
Carlsson, Per Arvid Emil; Carnmalm, Bernt Sigfrid Emanuel; Ross, Svante Bertil; and Ulff, Carl Bengt Johan, 4,102,887, Cl. 260-290.0HL.
Ulrich, Max Bernhard: *See—*
Baumann, Friedrich; and Ulrich, Max Bernhard, 4,101,985, Cl. 3-1.912.
Umezawa, Hamao; and Takeuchi, Tomio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for producing stable macromomycin powder. 4,102,999, Cl. 424-123.000.
Unimax Switch Corporation: *See—*
Schwarzkopf, Daniel, 4,103,132, Cl. 200-153.0LB.
Union Carbide Corporation: *See—*
Deem, Mary Lease, 4,102,930, Cl. 260-593.00R.
Martin, Jay Robert, 4,102,659, Cl. 62-17.000.
Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, 4,102,942, Cl. 260-836.000.
Union Oil Company of California: *See—*
Ransom, Robert C.; and Holm, LeRoy W., 4,102,396, Cl. 166-252.000.
Union Special Corporation: *See—*
Hsiao, James C.; and Gaudlitz, Robert H., 4,102,282, Cl. 112-121.260.
Union Special G.m.b.H.: *See—*
Rohr, Gunter, 4,102,284, Cl. 112-121.290.
United Electric Controls Company: *See—*
Reis, Robert D., 4,103,124, Cl. 200-51.00R.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Allsopp, Peter James, 4,103,099, Cl. 13-7.000.
United States Gypsum Company: *See—*
Cseri, Zoltan, 4,102,524, Cl. 248-56.000.
United States of America
Agriculture: *See—*
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,102,923, Cl. 260-553.00R.
Air Force: *See—*
Carroll, Charles E.; and Hobbs, William H., 4,102,431, Cl. 182-5.000.
Crosby, Edward L., Jr., 4,102,519, Cl. 244-125.000.
Frost, Harold M.; and Szabo, Thomas L., 4,102,207, Cl. 73-643.000.
Griffin, Warren R., 4,102,872, Cl. 528-362.000.
Hubbell, Wayne C.; and Chang, Christopher T., 4,103,339, Cl. 365-1.000.
Pizzarello, Frank A.; and LaChapelle, Theodore J., Jr., 4,103,144, Cl. 219-209.000.
Army: *See—*
Andre, William L., 4,102,074, Cl. 42-1.00E.
Brody, Philip S., 4,103,341, Cl. 365-117.000.
Devarakonda, Vasant K.; and Kovar, John L., 4,102,180, Cl. 73-91.000.
Magardo, Robert F.; Ambrosini, Leonard R.; and Isenson, Raymond S., 4,102,241, Cl. 89-155.000.
Martignoni, Pasquale; Murfree, James A., Jr.; Chew, William M.; and Ayers, Orval E., 4,102,988, Cl. 423-483.000.
Redman, Charles, 4,103,199, Cl. 313-101.000.
Regenos, Kenneth M.; and Barbano, Normand, 4,103,303, Cl. 343-100.0SA.
Energy: *See—*
Brown, Donald P.; and Cannon, Collins P., 4,103,165, Cl. 250-390.000.
Erickson, Gerald L., 4,103,148, Cl. 235-92.0PC.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,256, Cl. 331-94.50L.
Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., 4,103,257, Cl. 331-94.50L.
Lord, David E.; Petrini, Richard R.; and Carter, Gary W., 4,102,582, Cl. 356-241.000.
Sayre, Robert K., 4,102,739, Cl. 176-38.000.
Yasillo, Nicholas J., 4,103,310, Cl. 354-120.000.
Interior: *See—*
Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,102,816, Cl. 252-428.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A. System for the measurement of ultra-low stray light levels. 4,102,580, Cl. 356-210.000.
Navy: *See—*
Dildy, Clell A., Jr.; and Adair, Lyles C., 4,103,279, Cl. 340-3.00D.
Glick, Alvin L., 4,103,251, Cl. 331-1.00A.
Griffith, James R.; and O'Rear, Jacques G., 4,102,873, Cl. 528-331.000.
Johnson, Craig E.; Dendor, Paul F.; and Csanady, Elmer R., 4,102,953, Cl. 264-3.00B.
Wieder, Herman H.; and Davis, Neil M., 4,102,574, Cl. 356-117.000.
U.S. Philips Corporation: *See—*
Hunzinger, Jean-Jacques, 4,102,559, Cl. 350-96.180.
Meewezen, Willem Douwe, 4,103,239, Cl. 325-144.000.
Milants, Lodewijk Luciaan, 4,102,515, Cl. 242-199.000.
Westman, Kjell Harry, 4,103,288, Cl. 340-152.00R.
United States Steel Corporation: *See—*
Pringle, William L., 4,102,032, Cl. 29-520.000.
Shufran, Steve, 4,102,449, Cl. 198-774.000.
United Technologies Corporation: *See—*
Brahm, Charles B., 4,102,209, Cl. 73-702.000.
Clack, Frederick Argles, Jr., 4,102,011, Cl. 16-149.000.
Hulse, Charles Orcutt, 4,103,063, Cl. 415-212.00R.
Mercik, Henry J., Jr.; and Goetsch, Henry E., 4,102,178, Cl. 73-49.700.
University of Hawaii: *See—*
Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, 4,103,004, Cl. 424-177.000.
University of Pennsylvania: *See—*
Zemel, Jay N., 4,103,227, Cl. 324-65.00R.
University of Virginia, The: *See—*
Gear, Adrian R. L., 4,103,229, Cl. 324-71.0CP.
UOP Inc.: *See—*
Stone, Richard D., 4,102,776, Cl. 208-64.000.
Withers, James G., Jr., 4,102,393, Cl. 165-95.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,103,097, Cl. 568-807.000.
Bundy, Gordon L., 4,103,098, Cl. 568-838.000.
Nelson, Norman A., 4,102,899, Cl. 260-343.600.
Nelson, Norman A., 4,102,900, Cl. 260-343.600.
Schneider, William P., 4,102,897, Cl. 260-343.000.
Schneider, William P., 4,102,898, Cl. 260-343.000.
Shephard, Kenneth P., 4,102,907, Cl. 260-397.300.
Upton, Charles J.: *See—*
Crutchfield, Marvin M.; and Upton, Charles J., 4,102,903, Cl. 260-345.70R.
Urbanek, Karel, to Dominion Auto Accessories Limited. Lamp with resilient retainer ring. 4,103,323, Cl. 362-306.000.
Urgero, Peter P. Switch assembly for connecting opposing circuits on a printed circuit board. 4,103,134, Cl. 200-158.000.
Usui, Koichi: *See—*
Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna. Method for producing 4-nitrosodiphenylamine. 4,102,926, Cl. 260-576.000.
UVEX Winter Optik GmbH: *See—*
Stepan, Walter; and Hennecke, Klaus, 4,101,980, Cl. 2-9.000.
Uyama, Noboru; and Hara, Katsuaki, to Kubota Ltd. Electronic weighing apparatus. 4,102,420, Cl. 177-25.000.
Uzgiris, Egidijus E., to General Electric Company. Electrophoretic assay for antigen-antibody reaction based on particle-particle coupling. 4,102,990, Cl. 424-12.000.
Vacanti, Mary Frances. Device for plating and streaking a microbiological sample. 4,102,748, Cl. 195-127.000.
Vail, Sidney L.: *See—*
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,102,923, Cl. 260-553.00R.
Val Tech Inc.: *See—*
Krick, John B., 4,103,317, Cl. 361-31.000.
Valbert, Gary Glen, to Caterpillar Tractor Co. Hydromechanical shutoff for an internal combustion engine. 4,102,316, Cl. 123-198.0DB.
Valcor Engineering Corp.: *See—*
Gold, Joseph; and Farese, Frank, 4,102,492, Cl. 235-375.000.
Valentine, Irving R., to Weber-Valentine Company, Inc. Method of producing diazotype photoprinting material. 4,103,072, Cl. 428-425.000.
Valstyn, Erich Philipp: *See—*
Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
Van Dresser Corporation: *See—*
Doerer, Richard P., 4,102,975, Cl. 264-322.000.

van der Ley, Barteld Hendrik: *See*—
Roelse, Adriaan; and van der Ley, Barteld Hendrik, 4,102,647, Cl. 23-232.00R.

Vanderveen, John W.; and Hunt, Harold R., to Phillips Petroleum Company. Pelleting of carbon black. 4,102,967, Cl. 264-113.000.

Vandervelden, C. Keith; and Blake, William P., to Airco, Inc. Saturable reactor-type power supply. 4,103,324, Cl. 363-89.000.

van Heteren, Jan: *See*—
Bodor, Janos; van Heteren, Jan; and Verhagen, Laurentius Adrianus Maria, 4,103,037, Cl. 426-575.000.

Van Jepmond, Howard K.; and Milner, Ronald E., to Atari, Inc. Game method and apparatus for sensing the position of an object with respect to its receptacle. 4,102,532, Cl. 273-1.00E.

Van Peteghem, Antoine: *See*—
Hiemeleers, Jozef; De Schepper, Achille; and Van Peteghem, Antoine, 4,102,976, Cl. 423-87.000.

Van Rietschoten, Henk: *See*—
Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,102,511, Cl. 242-64.000.

van Steveninck, Johannes; and Hogervorst, Johannes R., to Shell Oil Company. Anchoring a pipeline to the ground. 4,102,145, Cl. 61-105.000.

Van Valkenburgh, Leslie. Ladder. 4,102,433, Cl. 182-164.000.

Vaplon, Gary Gene; Erickson, Edwin; and Young, Joseph L., to W. R. Grace & Co. Concentration of plate-shaped minerals. 4,102,502, Cl. 241-4.000.

Varga, Laszlo: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.

Varro, Vince: *See*—
Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.

Vdovin, Nikolai Mikhailovich: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.

Veazey, Robert W. Three dimensional time piece. 4,102,121, Cl. 58-44.000.

Ventre, Edmond: *See*—
Blum, Jacques Marcel; and Ventre, Edmond, 4,102,740, Cl. 176-84.000.

Veranneman, Georg: *See*—
Hildebrandt, Peter; Veranneman, Georg; and Schottroff, Werner, 4,102,386, Cl. 164-259.000.

Vereinigte Deutsche Metallwerke AG: *See*—
Wenderott, Berthold; and Kohlert, Gerhard, 4,102,709, Cl. 148-2.000.

Verenigde Energiebedrijven van het Scheldeland: *See*—
Timmermans, Armand; Selleslagh, Eduard; and Deneyer, Jose N. E., 4,103,233, Cl. 324-208.000.

Verger, Bernard: *See*—
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,102,757, Cl. 204-73.00R.

Verhagen, Laurentius Adrianus Maria: *See*—
Bodor, Janos; van Heteren, Jan; and Verhagen, Laurentius Adrianus Maria, 4,103,037, Cl. 426-575.000.

Verinigte Osterreichische Bisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See*—
Ziegler, Gerhard, 4,102,599, Cl. 415-219.00R.

Vernitron Corporation: *See*—
Howatt, Glenn N.; and Leonard, Murray, 4,103,264, Cl. 333-72.000.

Vesbach, Edwin G. Overhead door operator. 4,102,382, Cl. 160-188.000.

Vess, P. Jackson. Portable router attachment. 4,102,370, Cl. 144-134.00D.

Vianova Kunstharz, A.G.: *See*—
Honig, Helmut, 4,102,771, Cl. 204-299.0EC.

Vibra-King, Inc.: *See*—
Steinberg, Richard W., 4,102,402, Cl. 172-40.000.
Steinberg, Richard W., 4,102,403, Cl. 172-40.000.

Victor F. Weaver, Inc.: *See*—
Martin, Eugene G.; and Risser, Dale M., 4,102,014, Cl. 17-11.000.

Viessmann, Hans. Boiler for liquid or gaseous fuels. 4,102,309, Cl. 122-136.00R.

Vineski, John E.: *See*—
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., 4,102,681, Cl. 96-1.400.

Viney, Alan Charles: *See*—
Reade, Grahame Melvin; and Viney, Alan Charles, 4,102,301, Cl. 118-67.000.

Virag, Sandor: *See*—
Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.

Vitali, Joseph D., to Standard Oil Company (Indiana). Line synchronized interrupt generator. 4,103,335, Cl. 364-900.000.

Vock, Manfred Hugo: *See*—
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.
Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.

Voelker, Silvia Leonor: *See*—
Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, 4,103,346, Cl. 365-216.000.

Vogl, Rudolf, to Deggendorfer Werft und Eisenbau GmbH. Modular construction for a large catalytic reaction apparatus. 4,102,652, Cl. 23-288.00M.

Voglrieder, Leonhard; and Hempel, Raymond O., Jr., to Ex-Cell-O Corporation. Machining center with automatic tool changer. 4,102,035, Cl. 29-568.000.

Voith-Fischer Kunststofftechnik GmbH & Co. KG: *See*—
Scharrenbroich, Helmut, 4,102,626, Cl. 425-526.000.

Volk, Joseph A., Jr., to Borg-Warner Corporation. Sensitive inclinometer. 4,102,055, Cl. 33-345.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Rottenkolber, Paul, 4,102,602, Cl. 416-221.000.

Volkwein, Gert; and Baessler, Konrad, to Hoechst Aktiengesellschaft. Process for the preparation of 2,4-dinitroaniline. 4,102,927, Cl. 260-581.000.

von Ballmoos, Fritz, to Guhl & Scheibler AG, a part interest. Arrangement for controlling the access to an establishment and entry card suitable for such an arrangement. 4,103,150, Cl. 235-419.000.

Voronkova, Olga Nikolaevna: *See*—
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.

Votaw, Ronald W.: *See*—
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.

Vukich, Martin T. Concrete pumping machine. 4,102,613, Cl. 417-516.000.

W. R. Grace & Co.: *See*—
Vaplon, Gary Gene; Erickson, Edwin; and Young, Joseph L., 4,102,502, Cl. 241-4.000.

W. Schlafhorst & Co.: *See*—
Derichs, Josef; Raasch, Hans; Neuhaus, Ludwig; Langheinrich, Dieter; Schlosser, Helmut; and Baltsch, Erwin, 4,102,116, Cl. 57-34.00R.
Raasch, Hans; and Grecksch, Hans, 4,102,506, Cl. 242-18.0DD.

Wachendorf, Friedrich: *See*—
Hoffmann, Herbert; and Wachendorf, Friedrich, 4,102,507, Cl. 242-18.0PW.

Wachter, Michael P.: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,102,895, Cl. 260-340.600.

Wacker-Chemie GmbH: *See*—
Deubzer, Bernward; and Graf, Werner, 4,102,970, Cl. 264-176.00R.
Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, 4,102,860, Cl. 528-18.000.

Waddill, Harold G.: *See*—
Speranza, George P.; and Waddill, Harold G., 4,102,866, Cl. 528-135.000.

Wagener, Kenneth Boone: *See*—
Penton, Harold Roy, Jr.; and Wagener, Kenneth Boone, 4,102,867, Cl. 528-289.000.

Wagner, Anthony S.; and Kay, Kenneth R. Aquatic sound generating system for fishing lures. 4,102,075, Cl. 43-17.100.

Wagner Electric Corporation: *See*—
Siiberg, Hemming G., 4,103,265, Cl. 335-205.000.

Wagner, Eugene R.; and Allen, Bobbie J., to Dow Chemical Company, The. Amino substituted arylthio-alkanoic acids having hypolipidemic activity. 4,103,027, Cl. 424-309.000.

Wagner, Eugene R.; and Allen, Bobbie J., to Dow Chemical Company, The. Amino substituted arylthio-alkanoic acids having hypolipidemic activity. 4,103,029, Cl. 424-318.000.

Wagner, Ross I.: *See*—
Pilipovich, Donald; Goldberg, Ira B.; and Wagner, Ross I., 4,102,950, Cl. 423-579.000.

Wake, Malcolm, to Fletcher Sutcliffe Wild Limited. Mining equipment. 4,102,139, Cl. 61-45.00D.

Walden, Michael Dennis. Vehicular safety device. 4,102,426, Cl. 180-98.000.

Walker, Barvo N., to Dentsply Research & Development Corp. Dental teaching device. 4,102,047, Cl. 32-71.000.

Wall, Clarence J., to Dorr-Oliver Incorporated. Incineration of lime-conditioned sewage sludge with high sulfur fuel. 4,102,277, Cl. 110-342.000.

Wall, Larry W.: *See*—
Cusick, Richard D.; and Wall, Larry W., 4,102,307, Cl. 119-16.000.

Wallace Business Forms, Inc.: *See*—
Steidinger, Donald J., 4,102,251, Cl. 93-63.00M.

Wallman, Bernard Allan: *See—*
Sturrock, John Monro; and Wallman, Bernard Allan, 4,103,168, Cl. 250-442.000.
Wallsten, Hans Ivar, to Inventing S.A. Apparatus for applying a coating composition onto a moving web. 4,102,299, Cl. 118-50.000.
Walter, Richard T.: *See—*
Kipp, Michael A.; and Walter, Richard T., 4,102,484, Cl. 229-16.00A.
Walters, Ian Richard; and Emblem, Harold Garton, to Zirconal Processes Limited. Gellable binders. 4,102,691, Cl. 106-38.350.
Walworth, Vivian K.: *See—*
Gerber, Arthur M.; and Walworth, Vivian K., 4,102,758, Cl. 204-94.000.
Gerber, Arthur M.; and Walworth, Vivian K., 4,102,759, Cl. 204-94.000.
Ward, Bruce K. Venting device. 4,102,092, Cl. 52-92.000.
Ward, Donald H.: *See—*
Taylor, Donald M.; and Ward, Donald H., 4,102,105, Cl. 52-520.000.
Ward, Ronald C.: *See—*
Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., 4,103,268, Cl. 336-208.000.
Warner & Swasey Company, The: *See—*
Alcorn, Arnold B., 4,102,591, Cl. 407-100.000.
Washizuka, Isamu, to Sharp Kabushiki Kaisha. Fluorescent tube display calculators. 4,103,208, Cl. 315-51.000.
Wasmuth, Edward H.: *See—*
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,102,996, Cl. 424-89.000.
Watanabe, Seizaburo; Hattori, Eiji; and Mori, Kanau, to Asahi-Dow Limited. Foamed thermoplastic resin comprising a mixture of ionomer and polyolefin. 4,102,829, Cl. 521-81.000.
Watanabe, Syouzi: *See—*
Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.
Watson, Dean A.: *See—*
McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,103,174, Cl. 250-493.000.
Wavin B. V.: *See—*
de Putter, Warner Jan, 4,103,320, Cl. 361-215.000.
Weatherby, Inc.: *See—*
Jennie, Fred LeRoy, 4,102,243, Cl. 89-193.000.
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., to Smith International, Inc. Drill stem for drilling upwardly. 4,102,411, Cl. 173-164.000.
Webb, William M., to General Electric Company. Rear support structure for a cabinet. 4,102,556, Cl. 312-250.000.
Weber, Bernhard Georg; and Flury, Beat, to Synthes AG. Devices for tensioning surgical appliances. 4,102,339, Cl. 128-92.00E.
Weber, Dietmar, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Mixing extruder. 4,103,355, Cl. 366-90.000.
Weber-Valentine Company, Inc.: *See—*
Valentine, Irving R., 4,103,072, Cl. 428-425.000.
Webster Spring Co. Inc.: *See—*
Levine, Alexander M.; and Ramsey, Henry R., 4,101,992, Cl. 5-260.000.
Wedel, Carroll J.; and Parker, Phillip H., to Chevron Research Company. Extrusion stabilization of polypyrrolidone by hydroquinones. 4,102,861, Cl. 260-45.95E.
Weglein, Rolf D., to Hughes Aircraft Company. Triple-transit-suppressed bulk acoustic wave delay line. 4,103,263, Cl. 333-30.00R.
Weglin, Walter, to Jerobee Industries, Inc. Die and method of making the same. 4,102,735, Cl. 156-661.000.
Wehr Corporation: *See—*
Palme, Karl, 4,102,444, Cl. 188-72.100.
Wehrmeister, Gerhard: *See—*
Hemala, Zdenek; Nudinger, Guenter; and Wehrmeister, Gerhard, 4,102,115, Cl. 57-34.00R.
Wehrung, John M.: *See—*
McAlear, James H.; and Wehrung, John M., 4,103,064, Cl. 428-333.000.
McAlear, James H.; and Wehrung, John M., 4,103,073, Cl. 428-474.000.
Weiche, William Joseph: *See—*
Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, 4,103,066, Cl. 428-337.000.
Weidler, Erhard Alfred. Tire chain. 4,102,378, Cl. 152-243.000.
Weinberger, Lester; and Daskin, Robin, to Polychrome Corporation. Lithographic photosensitive compositions comprising acrylonitrile-butadiene-styrene terpolymer and novolak resin. 4,102.686, Cl. 96-91.00R.
Weiner, Steven A., to Ford Motor Company. Method for preparing a sodium/sulfur cell. 4,102,042, Cl. 29-623.200.
Weinert, Fritz K., to Weinschel Engineering Company. Closed loop for automatic substitution of a signal of equal amplitude. 4,103,223, Cl. 324-57.00R.
Weinschel Engineering Company: *See—*
Weinert, Fritz K., 4,103,223, Cl. 324-57.00R.
Weir, Alexander, Jr. Process for treating stack gases. 4,102,982, Cl. 423-242.000.
Weiss, David. Underwater bottom cleaning system and apparatus. 4,102,290, Cl. 114-222.000.
Weiss, Virgil W.: *See—*
Deex, Oliver D.; and Weiss, Virgil W., 4,102,864, Cl. 528-173.000.
Weissenfels, Franz; and Junger, Hans, to Dynamit Nobel Aktiengesellschaft. Method of hardening and foaming liquid resols using a mixture of diluent and aromatic sulfonic acid. 4,102,832, Cl. 521-103.000.
Wenderott, Berthold; and Kohlert, Gerhard, to Vereinigte Deutsche Metallwerke AG. Workable nickel alloy and process for making same. 4,102,709, Cl. 148-2.000.
Wendt, Michael E.; and Beaver, Danny D., to General Electric Company. Heat dissipating motor mounting arrangement. 4,103,192, Cl. 310-64.000.
Werner, Wolfgang: *See—*
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, 4,103,041, Cl. 427-2.000.
Wernet, William F.: *See—*
Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., 4,103,268, Cl. 336-208.000.
Wertz, James B., to Owens-Illinois, Inc. Method of controlling an extruder. 4,102,958, Cl. 264-40.600.
Wescan, Inc.: *See—*
Woodley, Keith R., 4,102,467, Cl. 220-67.000.
Western Electric Company, Inc.: *See—*
Dornberger, Georg Christian Ernst, 4,102,117, Cl. 57-93.000.
Dougherty, Timothy Stephen, 4,103,353, Cl. 366-81.000.
Westinghouse Electric Corp.: *See—*
Bhalla, Ranbir S., 4,103,200, Cl. 313-221.000.
Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., 4,102,149, Cl. 62-196.00A.
Elms, Robert T., 4,103,209, Cl. 315-207.000.
Fagan, John L., 4,103,348, Cl. 365-228.000.
Fagan, John Lee; White, Marvin Hart; and Lampe, Donald Ross, 4,103,344, Cl. 365-184.000.
Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, 4,102,765, Cl. 204-164.000.
Fey, Maurice G., 4,102,766, Cl. 204-164.000.
Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., 4,103,226, Cl. 324-61.00R.
Glatthorn, Raymond H., 4,103,140, Cl. 219-125.110.
Harvey, Francis J., II; and Fey, Maurice G., 4,102,764, Cl. 204-164.000.
Harvey, Francis J., II, 4,102,985, Cl. 423-350.000.
Kernick, Andress; Ravas, Richard J.; and Geyer, Manvel A., 4,102,436, Cl. 187-29.00R.
Lange, Frederick F.; and Singhal, Subhash C., 4,102,698, Cl. 106-65.000.
Leeds, Winthrop M., 4,103,130, Cl. 200-148.00A.
Luck, Russell M.; and Gainer, Gordon C., 4,102,851, Cl. 260-37.0EP.
Mandel, Alan F., 4,102,437, Cl. 187-29.00R.
Martz, Lyle F., 4,102,248, Cl. 91-42.000.
Mazelsky, Robert; Fey, Maurice G.; and Harvey, Francis J., 4,102,767, Cl. 204-164.000.
Smith, James D. B.; and Phillips, David C., 4,102,192, Cl. 73-339.00R.
Smith, James D. B.; and Phillips, David C., 4,102,193, Cl. 73-339.00R.
Smith, James D. B.; and Phillips, David C., 4,102,809, Cl. 252-408.000.
Stock, Alvin L.; Roddis, Gravatt K.; and Nygren, William C., 4,102,598, Cl. 415-135.000.
Thompson, John H.; Kowalyshyn, Stephen; and Nelkin, Arthur, 4,102,195, Cl. 73-340.000.
Yannone, Robert A.; and Reuther, John F., 4,103,178, Cl. 290-40.00R.
Westland Aircraft Limited: *See—*
Reid, Peter, 4,102,423, Cl. 180-7.00R.
Westman, Kjell Harry, to U.S. Philips Corporation. Method for data transmission and a system for carrying out the method. 4,103,288, Cl. 340-152.00R.
Westwood Pharmaceuticals Inc.: *See—*
Hebborn, Peter, 4,102,995, Cl. 424-81.000.
Whatman Reeve Angel Limited: *See—*
Head, Brian Arthur; and Kimball, Philip C., 4,102,736, Cl. 162-104.000.
Head, Brian Arthur; and Kimball, Philip C., 4,102,785, Cl. 210-65.000.
Whatmough, Nigel Stephen: *See—*
Robinson, Frank; and Whatmough, Nigel Stephen, 4,102,155, Cl. 66-176.000.
Wheatland Tube Company: *See—*
Saloom, Joseph T., 4,102,173, Cl. 72-306.000.
Wheatley, Carl Franklin, Jr., to RCA Corporation. Shunt voltage regulator. 4,103,219, Cl. 323-8.000.
Wheeler, Claud Ray, to Wire Rope Corporation of America, Inc. Multi-part wire rope fabric assembly. 4,102,118, Cl. 57-144.000.
Wheelock, Kenneth S., to Exxon Research & Engineering Co. Hydrocarbon conversion processes employing perovskite catalysts. 4,102,777, Cl. 208-121.000.
Wheelock, Thomas D., to Iowa State University Research Foundation, Inc. Simultaneous reductive and oxidative decomposition of calcium sulfate in the same fluidized bed. 4,102,989, Cl. 423-541.00R.
Whirlpool Corporation: *See—*
Beckett, Leo Gano; and Buchser, William J., 4,102,660, Cl. 62-344.000.
Doner, John T., 4,102,322, Cl. 126-198.000.
White, Allen A., to Hesston Corporation. Cantilevered tying needle construction for crop balers. 4,102,260, Cl. 100-24.000.
White, Allen A., to Hesston Corporation. Adjustable mounting for tying needles. 4,102,261, Cl. 100-24.000.

White, Marvin Hart: *See—*
Fagan, John Lee; White, Marvin Hart; and Lampe, Donald Ross, 4,103,344, Cl. 365-184.000.

White, Robert J.: *See—*
Benedict, Neil W.; and White, Robert J., 4,102,534, Cl. 173-137.000.

Whiteside, Arliss Eugene, to Bendix Corporation, The. Data transmission system using analog to pulse width to digital conversion. 4,103,337, Cl. 364-900.000.

Wibbelsman, Robert C., to General Electric Company. Bleed valve control system. 4,102,595, Cl. 415-1.000.

Wiechert, Rudolf: *See—*
Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,102,908, Cl. 260-397.400.

Wieder, Herman H.; and Davis, Neil M., to United States of America, Navy. Method and means of monitoring the quality of a fluid dielectric. 4,102,574, Cl. 356-117.000.

Wiendahl, Joachim; Jendrichowski, Klaus; and Sushradt, Wolfgang, to Holstein und Kappert Aktiengesellschaft. Spraying device for use in a bottle cleaning machine. 4,102,351, Cl. 134-129.000.

Wiener, Hans: *See—*
Wiener, Ingrid; and Wiener, Hans, 4,102,336, Cl. 128-75.000.

Wiener, Ingrid; and Wiener, Hans. Apparatus for traction therapy. 4,102,336, Cl. 128-75.000.

Wiersema, Richard J.: *See—*
Sperry, Peter Reeves; Wiersema, Richard J.; and Nyi, Kayson, 4,102,843, Cl. 260-29.6RW.

Wiesbeck, Werner: *See—*
Lindner, Kurt; and Wiesbeck, Werner, 4,103,259, Cl. 331-117.00D.

Wilgus, Conrad A.: *See—*
Ng, Walter C.; and Wilgus, Conrad A., 4,101,986, Cl. 4-325.000.

Wilkening, Hermann; and Loges, Hans-Joachim, to IOG Industrie-Ofenbau GmbH. Method for making a spiral coil having spaced turns. 4,102,170, Cl. 72-147.000.

Willard, David Frank: *See—*
Nicolini, John Dominic; and Willard, David Frank, 4,103,286, Cl. 340-146.200.

Willeke, Steven A.: *See—*
Grable, Jack W.; and Willeke, Steven A., 4,103,269, Cl. 337-67.000.

Williams, Danny R.: *See—*
Lewis, Kemp S., 4,102,054, Cl. 33-270.000.

Williams, Frank J., III; and Donahue, Paul E., to General Electric Company. Aromatic disulfone dianhydrides. 4,102,905, Cl. 260-346.300.

Williams, Gerald D.: *See—*
Estes, Larry A.; and Williams, Gerald D., 4,102,114, Cl. 56-15.200.

Williams, Keith A., to Phillips Petroleum Company. Fluid flow meter. 4,102,187, Cl. 73-209.000.

Williams, Rollin T. Scavenging device for animal waste. 4,102,547, Cl. 294-1.00R.

Willing, Jere J.: *See—*
Shulman, Abe; and Willing, Jere J., 4,102,367, Cl. 141-231.000.

Willis, Larry G.: *See—*
Summers, John J.; and Willis, Larry G., 4,103,052, Cl. 428-38.000.

Wills, Frank Eugene, to Borg-Warner Corporation. Heat pump control system. 4,102,389, Cl. 165-29.000.

Wilmot-Breeden Limited: *See—*
Jeavons, Philip Swingewood, 4,102,588, Cl. 403-245.000.

Wilson, George T., to Tenneco, Inc. Peripheral return flow muffler. 4,102,430, Cl. 181-265.000.

Windsurfing International, Inc.: *See—*
Corona, Peter J., 4,102,624, Cl. 425-429.000.

Winiasz, Michael Edward. Semi-automatic logsplitter. 4,102,373, Cl. 144-193.00A.

Winters, Harold Franklin, to International Business Machines Corporation. Hot filament, arc type ion source and method. 4,103,042, Cl. 427-38.000.

Winther, John L. Pump system providing selective directional flow across fluid barrier. 4,102,136, Cl. 61-29.000.

Wire Rope Corporation of America, Inc.: *See—*
Wheeler, Claud Ray, 4,102,118, Cl. 57-144.000.

Wisconsin Alumni Research Foundation: *See—*
Sih, Charles J., 4,103,006, Cl. 424-181.000.

Wisjo, Bjorn Alvar: *See—*
Ebbeson, Bengt Ebbe Oscar; and Wisjo, Bjorn Alvar, 4,102,289, Cl. 114-104.000.

Wisniewski, Edward F.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.

Withers, James G., Jr., to UOP Inc. Heat exchange apparatus. 4,102,393, Cl. 165-95.000.

Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, to Wacker-Chemie GmbH. Silicon-tin compounds as condensation catalysts in the preparation of organopolysiloxane elastomers. 4,102,860, Cl. 528-18.000.

Wolbrink, David W.; and Speaker, Richard L., to S I Handling Systems, Inc. Conveying apparatus including tilting support structures. 4,102,448, Cl. 198-365.000.

Wolf, Horst; and Seher, Rolf, to Zinser-Textilmaschinen GmbH. Draw twisting machine. 4,103,210, Cl. 318-46.000.

Wolff Walsrode Aktiengesellschaft: *See—*
Bohmer, Branislav; and Hoppe, Lutz, 4,103,080, Cl. 526-303.000.

Wood, Dennis E., to Rando Machine Corporation. Method of forming lignocellulosic fiber mats. 4,102,963, Cl. 264-91.000.

Wood, Howard L., to Wood's Powr-Grip Co., Inc. Valve control system for air powered vacuum pump. 4,102,609, Cl. 417-399.000.

Wood, Jack: *See—*
Davies, John H.; Wood, Jack; and Pearson, Michael, 4,103,017, Cl. 424-270.000.

Wood, Loren E.; and Short, Edward H., III, to Black, Sivalls & Bryson, Inc. Method of manufacturing integral fluid pressure rupturable apparatus. 4,102,167, Cl. 72-54.000.

Wood, Noel Sydney Davidson: *See—*
Nielsen, Carl Philip; and Wood, Noel Sydney Davidson, 4,102,101, Cl. 52-263.000.

Wood, William H., to Airheart Products, Inc. Cam operated disc brake. 4,102,440, Cl. 188-72.700.

Woodley, Keith R., to Wescan, Inc. Tapered plastic container with seamed metal end and method for making it. 4,102,467, Cl. 220-67.000.

Wood's Powr-Grip Co., Inc.: *See—*
Wood, Howard L., 4,102,609, Cl. 417-399.000.

Woodward, Oakley McDonald, to RCA Corporation. Dual channel transmission of microwave power through an interface of relative rotation. 4,103,262, Cl. 333-6.000.

Woodward, Robert John; and O'Connell, Walter. Male potency device. 4,102,335, Cl. 128-68.100.

Worldwide Converting Machinery, Inc.: *See—*
Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,102,511, Cl. 242-64.000.

Woychesin, Elias A.; and Legleu, Clovis P., III, to Kaiser Aluminum & Chemical Corporation. Removal of acidic impurity from chlorofluoromethanes. 4,102,981, Cl. 423-240.000.

Wright, James L. Grinding machine with means for advancing a saw. 4,102,224, Cl. 76-79.000.

Wristen, Cecil C., to Allis-Chalmers Corporation. Weld monitor. 4,103,141, Cl. 219-130.010.

Wuethrich, Hans-Rudolf: *See—*
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.

Wyatt Engineers, Inc.: *See—*
McManama, Gerald P., 4,102,278, Cl. 110-105.000.

Wyman, Charles L.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Xerox Corporation: *See—*
Bobick, Thomas W., 4,103,252, Cl. 331-48.000.
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
Deetz, David R., 4,102,265, Cl. 101-93.030.
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., 4,102,681, Cl. 96-1.400.
Goffe, William L.; and Mammino, Joseph, 4,102,682, Cl. 96-1.50R.
Schwarz, William M., 4,102,305, Cl. 118-651.000.
Shenfield, Leonard R., 4,103,326, Cl. 364-200.000.
Thacker, Charles P., 4,103,330, Cl. 364-200.000.
Thacker, Charles P., 4,103,331, Cl. 364-200.000.

Yaegashi, Takehisa: *See—*
Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.

Yamada, Kenzo: *See—*
Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, 4,102,675, Cl. 75-24.000.

Yamamoto, Hisao: *See—*
Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.

Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, to Nissan Motor Company, Ltd.; and Fuji Kiko Company, Ltd. Support assembly of a collapsible steering column. 4,102,217, Cl. 74-492.000.

Yamamoto, Youichi: *See—*
Saito, Yutaka; Yamamoto, Youichi; and Kojima, Hajime, 4,103,196, Cl. 310-266.000.

Yamaoka, Hiroshi: *See—*
Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, 4,102,694, Cl. 106-56.000.

Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, to Showa Oil Co., Ltd. Method of purifying a gas containing volatile organic materials. 4,102,983, Cl. 423-245.000.

Yamatake-Honeywell Co., Ltd.: *See—*
Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.

Yamauchi, Nobuyuki; and Taka, Takao, to Sumitomo Metal Industries, Ltd. Electrodes for tungsten inert gas welding. 4,103,143, Cl. 219-145.210.

Yannone, Robert A.; and Reuther, John F., to Westinghouse Electric Corp. Black start system for large steam powered electric generation plants. 4,103,178, Cl. 290-40.00R.

Yasillo, Nicholas J., to United States of America, Energy. Multiple-image oscilloscope camera. 4,103,310, Cl. 354-120.000.

Yasoshima, Nobuyuki: *See—*
Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.

Yates, Chester Robert; and Hall, Guy E., to Steadley Company, Inc. Wire spring assembly and components. 4,101,993, Cl. 5-267.000.

Yen, Shiao-Ping Siao: *See—*
Rembaum, Alan; and Yen, Shiao-Ping Siao, 4,102,827, Cl. 260-823.000.

Yin, Simon: *See—*
Howe, Francis M.; and Yin, Simon, 4,103,291, Cl. 340-522.000.

Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the removal of sucrose from a sugar mixture. 4,102,743, Cl. 195-7.000.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Transistor amplifier for low level signal. 4,103,245, Cl. 330-265.000.

Yoo, Jin S.: *See*—
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.

Yoon, Jong Un. Sugar dispensing apparatus. 4,102,477, Cl. 222-438.000.

Yoshida Kogyo K.K.: *See*—
Aoki, Tsunetaka, 4,102,022, Cl. 24-205.14R.
Okamoto, Taiichi, 4,102,246, Cl. 90-13.200.

Yoshida, Syusuke: *See*—
Okamoto, Miyoshi; and Yoshida, Syusuke, 4,103,054, Cl. 428-91.000.

Yoshikawa, Toshikazu: *See*—
Takimoto, Yasuyuki; and Yoshikawa, Toshikazu, 4,103,057, Cl. 428-156.000.

Young, Joseph L.: *See*—
Vaplon, Gary Gene; Erickson, Edwin; and Young, Joseph L., 4,102,502, Cl. 241-4.000.

Young, Richard W., to Amerada Hess Corporation. Hydro-carpet oil spillage containment and recovery device. 4,102,789, Cl. 210-252.0AS.

Yugen Kaisha Iiyoshi Seisakusho: *See*—
Iiyoshi, Shuichiro, 4,102,172, Cl. 72-254.000.

Yukl, Tex N. Electronic pain control system. 4,102,347, Cl. 128-421.000.

Yuta, Kouichi: *See*—
Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.

Zahid, Abduz, to Greer Hydraulics, Inc. Locking ring for pressure vessel and method of making the same. 4,102,465, Cl. 220-3.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; and Takeuchi, Tomio, 4,102,999, Cl. 424-123.000.

Zaki, Wahib Nassif; and Murphy, Alan Pearce, to Procter & Gamble Company, The. Fabric treatment compositions. 4,103,047, Cl. 427-242.000.

Zalotay, Elemer. Construction for supporting space units installed in a building especially a multi-storey building. 4,102,097, Cl. 52-167.000.

Zampaglione, Nicola: *See*—
Neustadt, Bernard R.; and Zampaglione, Nicola, 4,103,018, Cl. 424-272.000.

Zanzie, Edward A., to Paving Products, Inc. Pull type asphalt paver. 4,102,590, Cl. 404-110.000.

Zellweger, Conrad; and Guenin, Andre, to La Nationale S.A. Cigarette lighter. 4,102,633, Cl. 431-152.000.

Zemel, Jay N., to University of Pennsylvania. Ion-controlled diode. 4,103,227, Cl. 324-65.00R.

Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, to Ciba-Geigy Corporation. Amine salts of reactive dyestuffs. 4,102,639, Cl. 8-1.00A.

Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, to Daicel Ltd. Adsorbent process for oily materials. 4,102,783, Cl. 210-36.000.

Zhilkin, Leonid Filippovich: *See*—
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Ziegler, Gerhard, to Verinigte Osterreichische Bisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Turbine-generator assembly, installation and housing. 4,102,599, Cl. 415-219.00R.

Zielinski, James: *See*—
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,102,798, Cl. 252-51.50A.

Zinser-Textilmaschinen GmbH: *See*—
Wolf, Horst; and Seher, Rolf, 4,103,210, Cl. 318-46.000.

Zipperer, Martin: *See*—
Gansert, Willi; and Zipperer, Martin, 4,103,321, Cl. 361-388.000.

Zirconal Processes Limited: *See*—
Walters, Ian Richard; and Emblem, Harold Garton, 4,102,691, Cl. 106-38.350.

Zobbi, Robert G.: *See*—
Moriarty, William L.; and Zobbi, Robert G., 4,102,770, Cl. 204-195.00R.

Zollinger, Hans R., to H. A. Schlatter AG. Welding apparatus. 4,103,139, Cl. 219-101.000.

Zumwalt, Glen W.: *See*—
Lehl, Elvest L.; and Zumwalt, Glen W., 4,102,272, Cl. 104-23.0FS.

Zurbuchen, Jacques; and Dussy, Paul, to Ciba-Geigy Corporation. Process for the processing of organic textile materials. 4,102,640, Cl 8-73.000.

Zurrer, August: *See*—
Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, 4,102,368, Cl. 141-250.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JULY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cory Food Services, Inc.: *See*—
Schlegel, Norman H., Re. 29,708, Cl. 222-465.000.

Expert, N.V.: *See*—
Vissers, Herbert, deceased, Re. 29,709, Cl. 209-86.000.

Findeisen Brothers: *See*—
Findeisen, Kurt Ernst, Re. 29,706, Cl. 66-173.000.

Findeisen, Kurt Ernst, to Findeisen Brothers. Hosiery support. Re. 29,706, Cl. 66-173.000.

Loeffler, Herbert H. Product pressurized air dispenser having improved product control valve actuator. Re. 29,707, Cl. 222-193.000.

Schlegel, Norman H., to Cory Food Services, Inc. Decanter handle structure. Re. 29,708, Cl. 222-465.000.

Spisak, Edward G. Wheel and grease cap assembly. Re. 29,710, Cl. 301-37.00P.

Vissers, Herbert, deceased (by Vissers, Hermanus H.), to Expert, N.V. Apparatus for cooling castings and for cooling and drying moulding sand. Re. 29,709, Cl. 209-86.000.

Vissers, Hermanus H.: *See*—
Vissers, Herbert, deceased, Re. 29,709, Cl. 209-86.000.

W. R. Grace & Co.: *See*—
Wood, Louis L., Re. 29,711, Cl. 260-29.2TN.

Wood, Louis L., to W. R. Grace & Co. Polyureas and preparation thereof. Re. 29,711, Cl. 260-29.2TN.

LIST OF PLANT PATENTEES

Conard-Pyle Company, The: *See*—

Lindquist, Robert V., Sr., 4,283, Cl. 11.000.

Lindquist, Robert V., Sr., 4,284, Cl. 19.000.

Lindquist, Robert V., Sr., to Conard-Pyle Company, The. Rose plant. 4,283, 7-25-78, Cl. 11.000.

Lindquist, Robert V., Sr., to Conard-Pyle Company, The. Hybrid tea rose plant. 4,284, 7-25-78, Cl. 19.000.

Moling, LeRoy I. Cherry plum bush. 4,285, 7-25-78, Cl. 38.000.

LIST OF DESIGN PATENTEES

Acme Metal Goods Mfg. Co.: *See*—
Fischer, Kenneth F., 248,609, Cl. D7-152.000.

Adler, Peter: *See*—
Tougas, David; Adler, Peter; and Liszt, Mark, 248,605, Cl. D6-232.000.

Aikman, Leslie N. Filter element for a cigarette holder or the like. 248,673, 7-25-78, Cl. D27-7.000.

Allen-Stevens Corp.: *See*—
Cavalucci, Ralph, 248,617, Cl. D8-337.000.

Altec Corporation: *See*—
Nussdorfer, Dale A., 248,647, Cl. D14-30.000.

Anderson, Victor F., to Shell Oil Company. Bottle. 248,619, 7-25-78, Cl. D9-149.000.

Anthony, James R., to Indiana Mills & Manufacturing, Inc. Buckle. 248,618, 7-25-78, Cl. D8-395.000.

Apple, Edward Gorrell. Manual dental model remover. 248,663, 7-25-78, Cl. D24-10.000.

Associated Mills, Inc.: *See*—
Grube, Clifford E., 248,666, Cl. D24-36.000.

Bahmer, Melvin Herman. Thumb guard. 248,598, 7-25-78, Cl. D3-19.00E.

Beall, Lester, Jr., to Trend Line Furniture Corporation. Seat. 248,603, 7-25-78, Cl. D6-68.000.

Beatrice Foods Co.: *See*—
Schwartz, Daniel A., 248,610, Cl. D7-187.000.

Bellenger, Donald M.; and Major, Paul David, to Telephone Electronics Corporation. Telephone mouthpiece keyboard. 248,650, 7-25-78, Cl. D14-66.000.

Bennett, Alfred Weston: *See*—
Hay, David Stewart; and Bennett, Alfred Weston, 248,621, Cl. D9-219.000.

Berg, Albert T., Jr.; and Langlie, Howard. Front panel for knob-type electric fence insulator. 248,644, 7-25-78, Cl. D13-18.000.

Berg, Albert T., Jr.: *See*—
Langlie, Howard; and Berg, Albert T., Jr., 248,645, Cl. D13-18.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 248,602, Cl. D6-63.000.

Bishop, Philip F., to Transpan Products, Inc. Transmission drain pan. 248,637, 7-25-78, Cl. D12-155.000.

Bontempi, Marisa, to COMUS S.p.A. Electric Organ. 248,694, 7-25-78, Cl. D56-2.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 248,649, 7-25-78, Cl. D14-53.000.

Brehm, John Baptist. Acupressure therapeutic message device. 248,668, 7-25-78, Cl. D24-41.000.

Bretschger, Edward B., to Louis Marx & Co., Inc. Toy robot head. 248,687, 7-25-78, Cl. D34-15.0AD.

Brown, Glen J. Wind deflector for bicycles. 248,638, 7-25-78, Cl. D12-182.000.

Brown, Rex K. Manually operable ball tossing game apparatus. 248,685, 7-25-78, Cl. D34-15.0PP.

Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R. Nephelometer. 248,662, 7-25-78, Cl. D24-8.000.

Buffington, Herman L. Wine cask. 248,658, 7-25-78, Cl. D15-114.000.

Burroughs Corporation: *See*—
Clayton, Richard G.; and Schade, Robert C., 248,648, Cl. D14-40.000.

Camilo Muebles, Inc.: *See*—
Lopez, Jose A., 248,600, Cl. D6-31.000.

Cavalucci, Ralph, to Allen-Stevens Corp. Sash lock. 248,617, 7-25-78, Cl. D8-337.000.

Cepasy AG: *See*—
Lander, Lars, 248,604, Cl. D6-97.000.

Cibie, Pierre, to Cibie Projecteurs. Headlight. 248,691, 7-25-78, Cl. D48-32.00R.

Cibie Projecteurs: *See*—
Cibie, Pierre, 248,691, Cl. D48-32.00R.

Clayton, Richard G.; and Schade, Robert C., to Burroughs Corporation. Modular document processing encoder. 248,648, 7-25-78, Cl. D14-40.000.

Coker, George M., Jr.: *See*—
Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,683, Cl. D34-15.0AM.
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,684, Cl. D34-15.00C.

COMUS S.p.A.: *See*—
Bontempi, Marisa, 248,694, Cl. D56-2.000.

Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, to Pittway Corporation. Housing for fire and smoke detector. 248,629, 7-25-78, Cl. D10-121.000.

Consolidated Devices, Inc.: *See*—
Grabovac, Bosko, 248,615, Cl. D8-82.000.

Cornelius Company, The: *See—*
Kovar, Henry Charles, 248,692, Cl. D52-3.00R.
Dalton, Elliot Everett: *See—*
Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, 248,632, Cl. D11-131.000.
Darda, Helmut. Toy auto. 248,682, 7-25-78, Cl. D34-15.0AJ.
Dingwall, John Lindsay, to Moulded Components and Roto Moulding South Africa (Proprietary) Limited. Compost container. 248,611, 7-25-78, Cl. D7-194.000.
Dobias, John J. Wrench. 248,614, 7-25-78, Cl. D8-23.000.
Dogliotti, Amilcare, to P. Ferrero and C.-S.p.A. Package of candy or the like. 248,620, 7-25-78, Cl. D9-182.000.
Dominion Auto Accessories Limited: *See—*
Nagel, Robert I., 248,690, Cl. D48-32.00A.
Eichacker, Harold F.; and Eichacker, Richard F. Outdoor receptacle for receiving utility bills and the like. 248,676, 7-25-78, Cl. D31-24.000.
Eichacker, Richard F.: *See—*
Eichacker, Harold F.; and Eichacker, Richard F., 248,676, Cl. D31-24.000.
Emerson Electric Co.: *See—*
Thweatt, Carlisle, Jr., 248,641, Cl. D13-17.000.
Thweatt, Carlisle, Jr., 248,642, Cl. D13-17.000.
Thweatt, Carlisle, Jr., 248,643, Cl. D13-17.000.
Falcon Safety Products, Inc.: *See—*
Grossman, Morris Gary; and Levy, Edward D., 248,660, Cl. D16-33.000.
Fischer, Kenneth F., to Acme Metal Goods Mfg. Co. Potato peeler handle. 248,609, 7-25-78, Cl. D7-152.000.
Fujita, Eiji: *See—*
Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, 248,695, Cl. D64-11.00B.
Gane, Gordon R., to Kaiser Aluminum & Chemical Corporation. End closure for a container. 248,622, 7-25-78, Cl. D9-253.000.
Gane, Gordon R., to Kaiser Aluminum & Chemical Corporation. End closure for a container. 248,623, 7-25-73, Cl. D9-253.000.
Gaudiche, Xavier C. M., to Reboul-Sofra S.A. Powder-box. 248,675, 7-25-78, Cl. D28-78.000.
Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, to Wham-O Mfg. Co. Visual display apparatus. 248,632, 7-25-78, Cl. D11-131.000.
Goodwin, Max E.: *See—*
Pierce, James E.; and Goodwin, Max E., 248,601, Cl. D6-47.000.
Grabovac, Bosko, to Consolidated Devices, Inc. Drive tool. 248,615, 7-25-78, Cl. D8-82.000.
Graham, Roger. Smoking device. 248,671, 7-25-78, Cl. D27-03.000.
Graham, Roger. Mouthpiece for a smoking device. 248,672, 7-25-78, Cl. D27-05.000.
Grammer, Keith R.: *See—*
Pace, Thomas; and Grammer, Keith R., 248,613, Cl. D8-17.000.
Greenberg, Sheldon. Inflatable educational toy. 248,686, 7-25-78, Cl. D34-15.0DD.
Grossman, Morris Gary; and Levy, Edward D., to Falcon Safety Products, Inc. Photographic print drying apparatus. 248,660, 7-25-78, Cl. D16-33.000.
Grube, Clifford E., to Associated Mills, Inc. Back massager attachment. 248,666, 7-25-78, Cl. D24-36.000.
Hanig, Harvey: *See—*
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 248,629, Cl. D10-121.000.
Hannon, Thomas. Face shield. 248,674, 7-25-78, Cl. D28-9.000.
Harada, Toshio: *See—*
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.
Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.
Harvey, James Neal. Game board. 248,681, 7-25-78, Cl. D34-5.0SS.
Hauser, Stephen G.: *See—*
Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.
Hay, David Stewart; and Bennett, Alfred Weston, to Postmaster General of Canada. Covered container for mail or the like. 248,621, 7-25-78, Cl. D9-219.000.
Hickey, Larry G.: *See—*
James, Norman J.; and Hickey, Larry G., 248,639, Cl. D12-196.000.
Hirasa, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Radio communication transmitter. 248,653, 7-25-78, Cl. D14-95.000.
Homsy, Charles Albert; and Kent, John N. Temporomandibular joint prosthesis. 248,665, 7-25-78, Cl. D24-33.000.
Housman, Richard W. Vending machine. 248,693, 7-25-78, Cl. D52-3.00R.
Hsieh, Chin-Hou, to Valisum Industries Ltd. Rub for bicycle. 248,640, 7-25-78, Cl. D12-207.000.
Humlong, Robert F.: *See—*
Pawsat, Carlton P.; and Humlong, Robert F., 248,635, Cl. D12-125.000.
Indiana Mills & Manufacturing, Inc.: *See—*
Anthony, James R., 248,618, Cl. D8-395.000.
Ishii, Yoshiyasu: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,683, Cl. D34-15.0AM.
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,684, Cl. D34-15.00C.
J. I. Case Company: *See—*
Klein, Edward, 248,655, Cl. D15-15.000.
James, Norman J.; and Hickey, Larry G., to Rohr Industries, Inc. Front panel unit for a bus. 248,639, 7-25-78, Cl. D12-196.000.
Janys Designs Limited: *See—*
Waski, Jane, 248,680, Cl. D34-5.0SS.
Johnson, George A. Contoured motorcycle hand grip or the like. 248,616, 7-25-78, Cl. D8-303.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Gane, Gordon R., 248,622, Cl. D9-253.000.
Gane, Gordon R., 248,623, Cl. D9-253.000.
Kanawyer, Donald S. Combined tool for holding a keel and a layout pencil. 248,661, 7-25-78, Cl. D19-36.000.
Keith, Keith S.: *See—*
Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.
Kent, John N.: *See—*
Homsy, Charles Albert; and Kent, John N., 248,665, Cl. D24-33.000.
Klein, Edward, to J. I. Case Company. Lawn mower-tractor. 248,655, 7-25-78, Cl. D15-15.000.
Kovar, Henry Charles, to Cornelius Company, The. Coin acceptor or similar article. 248,692, 7-25-78, Cl. D52-3.00R.
Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Electronic calculator. 248,695, 7-25-78, Cl. D64-11.00B.
Lambert Corporation: *See—*
Ruhl, Walter F.; and Yeager, Robert R., 248,654, Cl. D15-12.000.
Lander, Lars, to Cepasy AG. Paper roll holder for toilet paper or similar article. 248,604, 7-25-78, Cl. D6-97.000.
Langlie, Howard; and Berg, Albert T., Jr. Front panel for all-purpose electric fence insulator. 248,645, 7-25-78, Cl. D13-18.000.
Langlie, Howard: *See—*
Berg, Albert T., Jr.; and Langlie, Howard, 248,644, Cl. D13-18.000.
Levy, Edward D.: *See—*
Grossman, Morris Gary; and Levy, Edward D., 248,660, Cl. D16-33.000.
Liszt, Mark: *See—*
Tougas, David; Adler, Peter; and Liszt, Mark, 248,605, Cl. D6-232.000.
Long, Stapleton, to Berkline Corporation, The. Seat. 248,602, 7-25-78, Cl. D6-63.000.
Lopez, Jose A., to Camilo Muebles, Inc. Chair. 248,600, 7-25-78, Cl. D6-31.000.
Lossini, Elio, to Raybeth Tool & Die Co., Inc. End connector for bracelet or the like. 248,631, 7-25-78, Cl. D11-94.000.
Louis Marx & Co., Inc.: *See—*
Bretschger, Edward B., 248,687, Cl. D34-15.0AD.
Vernon, John A., Jr., 248,688, Cl. D34-15.0AD.
Lucich, John C. Picture clock. 248,626, 7-25-78, Cl. D10-2.000.
Lucid Lines, Inc.: *See—*
Tougas, David; Adler, Peter; and Liszt, Mark, 248,605, Cl. D6-232.000.
Major, Paul David: *See—*
Bellenger, Donald M.; and Major, Paul David, 248,650, Cl. D14-66.000.
March, Michael. Vitreous panel for a storm door or the like. 248,670, 7-25-78, Cl. D25-72.000.
Marpac Corporation: *See—*
Ramsey, Roger, 248,669, Cl. D24-99.000.
Masso, Charles A. Mail box. 248,677, 7-25-78, Cl. D31-24.000.
Masta Associates: *See—*
Wood, Ronald W., 248,633, Cl. D11-155.000.
Matsuda, Hiroaki: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,683, Cl. D34-15.0AM.
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,684, Cl. D34-15.00C.
Matsushima, Hisatoshi: *See—*
Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, 248,695, Cl. D64-11.00B.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hirasa, Hiroshi, 248,653, Cl. D14-95.000.
Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, 248,695, Cl. D64-11.00B.
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.
Taguchi, Shuhei, 248,652, Cl. D14-70.000.
Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.
Maxwell, David E.; Shaffer, James R.; and Radtke, Lee, to Sun Electric Corporation. Timing light. 248,630, 7-25-78, Cl. D10-112.000.
Maxwell, Donald James, to Rizla Limited. Buoyant wick holder. 248,689, 7-25-78, Cl. D48-2.000.
Mears, George L. Baby seat. 248,599, 7-25-78, Cl. D6-8.000.
Melin, Arthur Kelso: *See—*
Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, 248,632, Cl. D11-131.000.
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 248,606, 7-25-78, Cl. D7-128.000.
Mori, Daisaku: *See—*
Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.
Moulded Components and Roto Moulding South Africa (Proprietary) Limited: *See—*
Dingwall, John Lindsay, 248,611, Cl. D7-194.000.

Nagel, Robert I., to Dominion Auto Accessories Limited. Combined stop and tail lamp lens. 248,690, 7-25-78, Cl. D48-32.00A.

Nagy, Charles R. Marionette. 248,678, 7-25-78, Cl. D34-2.00A.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Toy vehicle. 248,683, 7-25-78, Cl. D34-15.0AM.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Toy music box. 248,684, 7-25-78, Cl. D34-15.00C.

Neyman, Hubert King. Combined safety harness and light. 248,596, 7-25-78, Cl. D2-27.000.

Nussdorfer, Dale A., to Altec Corporation. Loudspeaker. 248,647, 7-25-78, Cl. D14-30.000.

Oas, David B., to Tantera, Inc. Leaf rake. 248,612, 7-25-78, Cl. D8-13.000.

Oneida Ltd.: *See—*
Perry, Frank R., 248,608, Cl. D7-137.000.

P. Ferrero and C.-S.p.A.: *See—*
Dogliotti, Amilcare, 248,620, Cl. D9-182.000.

Pace, Thomas; and Grammer, Keith R. Gas main valve wrench. 248,613, 7-25-78, Cl. D8-17.000.

Parise, Carl, to Parise & Sons, Inc. Hot-water extraction unit. 248,656, 7-25-78, Cl. D15-52.000.

Parise, Carl, to Parise & Sons, Inc. Home vacuum/water extraction cleaning unit. 248,657, 7-25-78, Cl. D15-52.000.

Parise & Sons, Inc.: *See—*
Parise, Carl, 248,656, Cl. D15-52.000.
Parise, Carl, 248,657, Cl. D15-52.000.

Pawsat, Carlton P.; and Humlong, Robert F., to Wald Manufacturing Company, Inc. Bicycle pedal. 248,635, 7-25-78, Cl. D12-125.000.

Perry, Frank R., to Oneida Ltd. Spoon or similar article. 248,608, 7-25-78, Cl. D7-137.000.

Pierce, James E.; and Goodwin, Max E. Foldable bleacher seat. 248,601, 7-25-78, Cl. D6-47.000.

Pittway Corporation: *See—*
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 248,629, Cl. D10-121.000.

Plugge, Jerome R. Hydrotherapeutic apparatus. 248,667, 7-25-78, Cl. D24-38.000.

Postmaster General of Canada: *See—*
Hay, David Stewart; and Bennett, Alfred Weston, 248,621, Cl. D9-219.000.

Priarone, Paul: *See—*
Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.

Pro Sports Marketing, Inc.: *See—*
Zivica, Robert F., 248,651, Cl. D14-69.000.

Radtke, Lee: *See—*
Maxwell, David E.; Shaffer, James R.; and Radtke, Lee, 248,630, Cl. D10-112.000.

Ramsey, Roger, to Marpac Corporation. Electronic sound conditioning device. 248,669, 7-25-78, Cl. D24-99.000.

Raybeth Tool & Die Co., Inc.: *See—*
Lossini, Elio, 248,631, Cl. D11-94.000.

Rebert, James F.; and Rebert, John W. Console record player. 248,646, 7-25-78, Cl. D14-17.000.

Rebert, John W.: *See—*
Rebert, James F.; and Rebert, John W., 248,646, Cl. D14-17.000.

Reboul-Sofra S.A.: *See—*
Gaudiche, Xavier C. M., 248,675, Cl. D28-78.000.

Richard Heinze GmbH & Co. KG,, Firma: *See—*
Spellier, Roland, 248,624, Cl. D8-313.000.

Rite Autotronics Corp.: *See—*
Schwartz, Edwin L., 248,628, Cl. D10-75.000.

Rizla Limited: *See—*
Maxwell, Donald James, 248,689, Cl. D48-2.000.

Robertson, Roy C. A.: *See—*
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 248,629, Cl. D10-121.000.

Rodriguez, Rodolfo R.: *See—*
Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.

Roesch, Edgar B., to Roesch Trust of which Lesley B. Roesch and Robert Patterson are trustees, The. Combined guide and lock for a sliding window sash. 248,625, 7-25-78, Cl. D8-339.000.

Roesch Trust of which Lesley B. Roesch and Robert Patterson are trustees, The: *See—*
Roesch, Edgar B., 248,625, Cl. D8-339.000.

Rohr Industries, Inc.: *See—*
James, Norman J.; and Hickey, Larry G., 248,639, Cl. D12-196.000.

Ruhl, Walter F.; and Yeager, Robert R., to Lambert Corporation. Cultivator. 248,654, 7-25-78, Cl. D15-12.000.

Rule, Robert J., to W. H. Brine Co. Lacrosse stick head. 248,679, 7-25-78, Cl. D34-5.0CT.

Schade, Robert C.: *See—*
Clayton, Richard G.; and Schade, Robert C., 248,648, Cl. D14-40.000.

Schneider, Michael, Sr. Boring bit. 248,659, 7-25-78, Cl. D15-139.000.

Schwartz, Daniel A., to Beatrice Foods Co. Bucket. 248,610, 7-25-78, Cl. D7-187.000.

Schwartz, Edwin L., to Rite Autotronics Corp. Transmitter monitoring meter. 248,628, 7-25-78, Cl. D10-75.000.

Shaffer, James R.: *See—*
Maxwell, David E.; Shaffer, James R.; and Radtke, Lee, 248,630, Cl. D10-112.000.

Shell Oil Company: *See—*
Anderson, Victor F., 248,619, Cl. D9-149.000.

Simod S.a.s. di Sinigaglia Paolo & C.: *See—*
Sinigaglia, Paolo, 248,597, Cl. D2-272.000.

Sinigaglia, Paolo, to Simod S.a.s. di Sinigaglia Paolo & C. After ski boot. 248,597, 7-25-78, Cl. D2-272.000.

Souza, Robert; and Thompson, Richard E. Bicycle. 248,634, 7-25-78, Cl. D12-111.000.

Spellier, Roland, to Richard Heinze GmbH & Co. KG,, Firma. Handle for furniture doors, drawers or the like. 248,624, 7-25-78, Cl. D8-313.000.

Stanley, Harvey L. Automobile accessory mount. 248,636, 7-25-78, Cl. D12-155.000.

Sun Electric Corporation: *See—*
Maxwell, David E.; Shaffer, James R.; and Radtke, Lee, 248,630, Cl. D10-112.000.

Taguchi, Shuhei, to Matsushita Electric Industrial Co., Ltd. Portable radio. 248,652, 7-25-78, Cl. D14-70.000.

Takahashi, Hanji: *See—*
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.
Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.

Takahashi, Nagashige. Endoscope. 248,664, 7-25-78, Cl. D24-18.000.

Takahashi, Yoichi: *See—*
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.
Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.

Tantera, Inc.: *See—*
Oas, David B., 248,612, Ci. D8-13.000.

Telefonaktiebolaget L M Ericsson: *See—*
Breger, Carl-Arne, 248,649, Cl. D14-53.000.

Telephone Electronics Corporation: *See—*
Bellenger, Donald M.; and Major, Paul David, 248,650, Cl. D14-66.000.

Thompson, Richard E.: *See—*
Souza, Robert; and Thompson, Richard E., 248,634, Cl. D12-111.000.

Thweatt, Carlisle, Jr., to Emerson Electric Co. Insulator for an open coil electric heating unit. 248,641, 7-25-78, Cl. D13-17.000.

Thweatt, Carlisle, Jr., to Emerson Electric Co. Insulator for an open coil electric heating unit. 248,642, 7-25-78, Cl. D13-17.000.

Thweatt, Carlisle, Jr., to Emerson Electric Co. Insulator for an open coil electric heating unit. 248,643, 7-25-78, Cl. D13-17.000.

Tougas, David; Adler, Peter; and Liszt, Mark, to Lucid Lines, Inc. Picture frame. 248,605, 7-25-78, Cl. D6-232.000.

Transpan Products, Inc.: *See—*
Bishop, Philip F., 248,637, Cl. D12-155.000.

Trend Line Furniture Corporation: *See—*
Beall, Lester, Jr., 248,603, Cl. D6-68.000.

Tyndall, Jerry C. Detector or the like. 248,627, 7-25-78, Cl. D10-46.000.

Valisum Industries Ltd.: *See—*
Hsieh, Chin-Hou, 248,640, Cl. D12-207.000.

Vernon, John A., Jr., to Louis Marx & Co., Inc. Toy robot head. 248,688, 7-25-78, Cl. D34-15.0AD.

W. H. Brine Co.: *See—*
Rule, Robert J., 248,679, Cl. D34-5.0CT.

Wald Manufacturing Company, Inc.: *See—*
Pawsat, Carlton P.; and Humlong, Robert F., 248,635, Cl. D12-125.000.

Waski, Jane, to Janys Designs Limited. Marble dispensing game apparatus. 248,680, 7-25-78, Cl. D34-5.0SS.

Wham-O Mfg. Co.: *See—*
Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, 248,632, Cl. D11-131.000.

Wood, Ronald W., to Masta Associates. Planter. 248,633, 7-25-78, Cl. D11-155.000.

Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 248,607, 7-25-78, Cl. D7-128.000.

Yamamura, Masamichi: *See—*
Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.

Yeager, Robert R.: *See—*
Ruhl, Walter F.; and Yeager, Robert R., 248,654, Cl. D15-12.000.

Yonekura, Hiroshi: *See—*
Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, 248,695, Cl. D64-11.00B.

Zivica, Robert F., to Pro Sports Marketing, Inc. Radio cabinet. 248,651, 7-25-78, Cl. D14-69.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 25, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8	4,101,979
9	4,101,980
182.6	4,101,981
409	4,101,982
412	4,101,983

CLASS 3

1.5	4,101,984
1.912	4,101,985

CLASS 4

172	4,101,987
173 R	4,101,988
191	4,101,989
325	4,101,986

CLASS 5

63	4,101,990
90	4,101,991
260	4,101,992
267	4,101,993
344	4,101,994
371	4,101,995

CLASS 8

1 A	4,102,639
10.1	4,102,641
73	4,102,640
125	4,102,642
149.3	4,102,643
164	4,102,644

CLASS 9

1.3	4,101,996
310 A	4,101,997
316	4,101,998

CLASS 13

7	4,103,099
20	4,103,100

CLASS 15

1.5 R	4,101,999
41 R	4,102,000
104.1 C	4,102,001
119 A	4,102,002
250.42	4,102,003

CLASS 16

49	4,102,004
	4,102,005
51	4,102,006
94 R	4,102,007
96 R	4,102,008
100	4,102,009
115	4,102,010
149	4,102,011
179	4,102,012
189	4,102,013

CLASS 17

11	4,102,014
	4,102,015

CLASS 19

159 R	4,102,016
203	4,102,017

CLASS 21

102 R	4,102,645

CLASS 23

230 R	4,102,646
232 R	4,102,647
254 EF	4,102,648
259	4,102,649
270.5 W	4,102,650
277 R	4,102,651
288 M	4,102,652

CLASS 24

68 CD	4,102,018
117	4,102,019
164	4,102,020
205.14 R	4,102,022

CLASS 26

16	4,102,023

CLASS 29

6.2	4,102,024
25.42	4,102,021
110.5	4,102,026
116 AD	4,102,025
157.3 AH	4,102,027
281.5	4,102,028
417	4,102,029
458	4,102,030
464	4,102,031
520	4,102,032
525	4,102,036
527.3	4,102,033
565	4,102,034
568	4,102,035
583	4,102,037
592 R	4,102,038
593	4,102,039
598	4,102,040
600	4,102,041
623.2	4,102,042
739	4,102,043

CLASS 30

34.2	4,102,044
287	4,102,045
346.53	4,102,046

CLASS 32

71	4,102,047

CLASS 33

1 A	4,102,048
1 B	4,102,049
76 R	4,102,050
174 P	4,102,051
180 R	4,102,052
233	4,102,053
270	4,102,054
345	4,102,055

CLASS 34

10	4,102,056
	4,102,057
155	4,102,058

CLASS 35

25	4,102,059
39	4,102,060

CLASS 36

28	4,102,061
72 R	4,102,062
117	4,102,063

CLASS 37

67	4,102,064
104	4,102,066

CLASS 38

102.1	4,102,065

CLASS 40

124.2	4,102,072
301	4,102,073
455	4,102,067
491	4,102,068
497	4,102,069
498	4,102,070
531	4,102,071

CLASS 42

1 E	4,102,074

CLASS 43

17.1	4,102,075

CLASS 44

16 R	4,102,653

CLASS 46

220	4,102,076
	4,102,077

CLASS 47

7	4,102,078
58	4,102,079
67	4,102,080
	4,102,081

CLASS 51

101 R	4,102,082
170 MT	4,102,084
170 R	4,102,083
295	4,102,085

CLASS 52

9	4,102,086
	4,102,087
20	4,102,088
36	4,102,089
58	4,102,090
79.7	4,102,091
92	4,102,092
101	4,102,093
116	4,102,094
122	4,102,095
	4,102,096
140	4,102,098
167	4,102,097
171	4,102,099
227	4,102,100
263	4,102,101
338	4,102,102
406	4,102,103
494	4,102,104
520	4,102,105
533	4,102,106
553	4,102,107
693	4,102,108

CLASS 53

24	4,102,109
59 R	4,102,110
182 R	4,102,111
228	4,102,112
366	4,102,113

CLASS 55

102	4,102,654
201	4,102,655
210	4,102,656
222	4,102,657
230	4,102,658

CLASS 56

15.2	4,102,114

CLASS 57

34 R	4,102,115
	4,102,116
93	4,102,117
144	4,102,118

CLASS 58

23 R	4,102,119
38 R	4,102,120
44	4,102,121
58	4,102,122
140 R	4,102,123

CLASS 59

86	4,102,124

CLASS 60

39.53	4,102,125
276	4,102,126
284	4,102,127
400	4,102,128
403	4,102,129
407	4,102,130
431	4,102,131
433	4,102,132
641	4,102,133

CLASS 61

1 F	4,102,134
10	4,102,135
29	4,102,136
38	4,102,137
42	4,102,138
45 D	4,102,139
	4,102,140
53.5	4,102,141
	4,102,147
86	4,102,142
94	4,102,143
103	4,102,144
105	4,102,145
110	4,102,146

CLASS 62

17	4,102,659
77	4,102,148
196 A	4,102,149
209	4,102,150
278	4,102,151
344	4,102,660
428	4,102,152

CLASS 64

28 R	4,102,153
29	4,102,154

CLASS 65

2	4,102,661
5	4,102,662
18	4,102,663
23	4,102,664
30 E	4,102,665
33	4,102,666

CLASS 66

173	Re.29,706
176	4,102,155

CLASS 68

4	4,102,156
5 D	4,102,157
5 E	4,102,158
132	4,102,159
229	4,102,160

CLASS 70

42	4,102,161
52	4,102,162
58	4,102,163
241	4,102,164
456 B	4,102,165
456 R	4,102,166

CLASS 71

3	4,102,667
90	4,102,668
94	4,102,669
98	4,102,670
	4,102,671
106	4,102,672
120	4,102,673

CLASS 72

54	4,102,167
117	4,102,168
128	4,102,169
147	4,102,170
245	4,102,171
254	4,102,172
306	4,102,173
421	4,102,174

CLASS 73

4 R	4,102,175
12	4,102,176
32 R	4,102,177
49.7	4,102,178
61.1 C	4,102,179
91	4,102,180
119 A	4,102,181
136 R	4,102,182
144	4,102,183
146.2	4,102,184
155	4,102,185
170 R	4,102,188
194 A	4,102,186
209	4,102,187
230	4,102,189
302	4,102,190
313	4,102,191
339 R	4,102,192
	4,102,193
340	4,102,194
	4,102,195
341	4,102,196
354	4,102,197
362 AR	4,102,198
	4,102,199
371	4,102,200
421.5 R	4,102,201
517 B	4,102,202
620	4,102,203
626	4,102,204
	4,102,205
643	4,102,207
644	4,102,206
647	4,102,208
702	4,102,209
727	4,102,210

CLASS 74

66	4,102,211
89.22	4,102,212
110	4,102,213
230.17 E	4,102,214
243 DR	4,102,215
245 R	4,102,216
492	4,102,217
493	4,102,218
502	4,102,219
572	4,102,220
	4,102,221
866	4,102,222

CLASS 75

3	4,102,674
24	4,102,675
77	4,102,676
124	4,102,225
128 A	4,102,677
226	4,102,679
257	4,102,680

CLASS 76

25 A	4,102,223
79	4,102,224

CLASS 81

3.33	4,102,226

CLASS 83

7	4,102,227
156	4,102,228
712	4,102,229
835	4,102,230
854	4,102,231
	4,102,232

CLASS 84

258	4,102,233
322	4,102,234
411 R	4,102,235
	4,102,236
421	4,102,237

CLASS 85

10 E	4,102,238
50 R	4,102,239

CLASS 86

20 C	4,102,240

CLASS 89

155	4,102,241
191 R	4,102,242
193	4,102,243

CLASS 90

1	4,102,244
12 R	4,102,245
13.2	4,102,246
62 R	4,102,247

CLASS 91

42	4,102,248
186	4,102,249
412	4,102,250

CLASS 93

36.3	4,102,252
63 M	4,102,251
93 C	4,102,253

CLASS 96

1.4	4,102,681
1.5 R	4,102,682
38.4	4,102,683
61 M	4,102,684
73	4,102,685
91 R	4,102,686
114.1	4,102,312
115 R	4,102,687
139	4,102,688

CLASS 98

115 R	4,102,254

CLASS 99

303	4,102,255
372	4,102,256
494	4,102,257
532	4,102,258

CLASS 100

3	4,102,259
24	4,102,260
	4,102,261
53	4,102,262
74	4,102,263

CLASS 101

77	4,102,264
93.03	4,102,265
124	4,102,266
132.5	4,102,267
399	4,102,268

CLASS 102

38 LP	4,102,269
49.5	4,102,270
52	4,102,271

CLASS 104

23 FS	4,102,272
34	4,102,273

CLASS 105

367	4,102,274

CLASS 106

1.23	4,102,702
38.28	4,102,690
38.35	4,102,691
38.9	4,102,689
50	4,102,692
54	4,102,693
56	4,102,694
64	4,102,695
65	4,102,698
73.2	4,102,696
84	4,102,699
100	4,102,700
111	4,102,697
	4,102,701
287.14	4,102,703
288 Q	4,102,704

CLASS 108

92	4,102,275
156	4,102,276

CLASS 110

105	4,102,278
234	4,102,279
342	4,102,277

CLASS 112

121.26	4,102,280
	4,102,281
	4,102,282
121.29	4,102,284
131	4,102,283

CLASS 113

54 R	4,102,285
119	4,102,286

CLASS 114

39	4,102,287
41	4,102,288
104	4,102,289
222	4,102,290
244	4,102,291

CLASS 115

1 R	4,102,292
28 R	4,102,293

CLASS 116

103	4,102,294
114 R	4,102,295
124 B	4,102,296
142 FP	4,102,297

CLASS 118

5	4,102,298
50	4,102,299
67	4,102,300
	4,102,301
239	4,102,302
326	4,102,303
421	4,102,304
651	4,102,305
658	4,102,306

CLASS 119

16	4,102,307
52 R	4,102,308

CLASS 122

136 R	4,102,309

CLASS 123

117 R	4,102,310
	4,102,311
119 B	4,102,314
119 EC	4,102,313
124 B	4,102,315
198 DB	4,102,316

CLASS 126

25 B	4,102,317
103	4,102,318
121	4,102,319
	4,102,320
140	4,102,321
198	4,102,322
261	4,102,323
270	4,102,324
	4,102,325
	4,102,326
271	4,102,327
	4,102,328
	4,102,329
374	4,102,330

CLASS 127

37	4,102,705

CLASS 128

2.1 A	4,102,332
2.1 E	4,102,331
6	4,102,333
36	4,102,334
68.1	4,102,335
75	4,102,336
80 E	4,102,337
90	4,102,338
92 E	4,102,339
287	4,102,340
303.14	4,102,341
325	4,102,342
327	4,102,343
419 E	4,102,344
419 PS	4,102,346
419 PT	4,102,345
421	4,102,347
422	4,102,348

CLASS 131

135	4,102,349

CLASS 134

3	4,102,706
22 R	4,102,707
129	4,102,351
130	4,102,350

CLASS 135

1 R	4,102,352
5 R	4,102,353

CLASS 136

233	4,102,708

CLASS 137

98	4,102,354
596.15	4,102,355
614.06	4,102,356
625.32	4,102,357

CLASS 138

35	4,102,358
42	4,102,359
127	4,102,360

CLASS 139

435	4,102,361
	4,102,362
449	4,102,363

CLASS 141

4	4,102,364
39	4,102,365
150	4,102,366
231	4,102,367
250	4,102,368

CLASS 144

114 R	4,102,369
134 D	4,102,370
162 R	4,102,371
178	4,102,372
193 A	4,102,373
314 B	4,102,374

CLASS 145

75	4,102,375

CLASS 148

2	4,102,709
6.15 R	4,102,710
12.3	4,102,711
113	4,102,713
187	4,102,714
188	4,102,715

CLASS 150

2	4,102,376
52 M	4,102,377

CLASS 152

243	4,102,378
405	4,102,379

CLASS 156

48	4,102,716
64	4,102,717
71	4,102,718
78	4,102,719
	4,102,720
79	4,102,721
99	4,102,722
120	4,102,723
149	4,102,724
200	4,102,725
244.11	4,102,726
251	4,102,727
362	4,102,728
384	4,102,729
499	4,102,730
540	4,102,731
645	4,102,732
653	4,102,733
659	4,102,734
661	4,102,735

CLASS 157

1.26	4,102,380

CLASS 160

168 R	4,102,381
188	4,102,382
263	4,102,383
	4,102,384
	4,102,385

CLASS 162

104	4,102,736
113	4,102,737
117	4,102,738

CLASS 164

259	4,102,386

CLASS 165

1	4,102,387
	4,102,388
29	4,102,389
	4,102,390
	4,102,391
62	4,102,392
95	4,102,393

CLASS 166

65 R	4,102,394
231	4,102,395
252	4,102,396
259	4,102,397
276	4,102,398
	4,102,399
283	4,102,400
284	4,102,401

CLASS 172

40	4,102,402
	4,102,403
310	4,102,404
378	4,102,405
540	4,102,406
611	4,102,407

CLASS 173

2	4,102,408
50	4,102,409
133	4,102,410
137	4,102,534
164	4,102,411

CLASS 174

65 R	4,103,101
68.5	4,103,102
70 S	4,103,104
140 C	4,103,103

CLASS 175

5	4,102,412
53	4,102,413
85	4,102,414
96	4,102,415
227	4,102,416
253	4,102,417
324	4,102,418
371	4,102,419

CLASS 176

38	4,102,739
84	4,102,740
87	4,102,741

CLASS 177

25	4,102,420
185	4,102,421
210 C	4,102,422

CLASS 179

1 VC	4,103,105
2 EB	4,103,106
2 EC	4,103,107
15 A	4,103,109
	4,103,111
15 BF	4,103,108
15 FD	4,103,110
18 FA	4,103,112
27 CA	4,103,113
84 R	4,103,114
90 B	4,103,115
100.41 M	4,103,116
100.41 Z	4,103,117
170 D	4,103,118

CLASS 180

7 R	4,102,423
24.02	4,102,424
66 F	4,102,425
98	4,102,426
156	4,102,427

CLASS 181

116	4,102,428
117	4,102,429
265	4,102,430

CLASS 182

5	4,102,431
92	4,102,432
164	4,102,433
181	4,102,434

CLASS 187

8.5	4,102,435
29 R	4,102,436
	4,102,437

CLASS 188

18 A	4,102,438
24	4,102,439
72.1	4,102,444
72.7	4,102,440
77 W	4,102,441
206 A	4,102,442
218 XL	4,102,443

CLASS 191

12.2 R	4,102,445

CLASS 192

°; A	4,102,446
10 B	4,102,447

CLASS 195

7	4,102,743
28 R	4,102,744
31 R	4,102,745
63	4,102,746
103.5 C	4,102,747
103.5 R	4,102,742
127	4,102,748

CLASS 198

365	4,102,448
774	4,102,449
	4,102,450

CLASS 200

35 R	4,103,119
48 A	4,103,121
48 P	4,103,122
48 R	4,103,120
	4,103,123
51 R	4,103,124
	4,103,125
67 C	4,103,126
67 G	4,103,127
144 AP	4,103,128
144 R	4,103,129
148 A	4,103,130
	4,103,131
153 LB	4,103,132
153 N	4,103,133
158	4,103,134
185	4,103,135
302	4,103,136

CLASS 201

2.5	4,102,749
6	4,102,750

CLASS 202

151	4,102,751
180	4,102,752

CLASS 203

64	4,102,753

CLASS 204

43 T	4,102,755
	4,102,756
73 R	4,102,757
94	4,102,758
	4,102,759
159.18	4,102,760
159.20	4,102,761
159.22	4,102,762
162 R	4,102,763
164	4,102,764
	4,102,765
	4,102,766
	4,102,767
192 P	4,102,768
195 C	4,102,769
195 R	4,102,770
206	4,102,772
275	4,102,754
299 EC	4,102,771

CLASS 206

219	4,102,451
387	4,102,452
507	4,102,453
514	4,102,454
569	4,102,455
575	4,102,456
611	4,102,457

CLASS 208

8	4,102,773
	4,102,774
10	4,102,775
64	4,102,776
121	4,102,777
143	4,102,778
211	4,102,779

CLASS 209

39	4,102,780
86	Re.29,709
166	4,102,781

CLASS 210

31 C	4,102,782
36	4,102,783
47	4,102,784
65	4,102,785
80	4,102,786
104	4,102,787
230	4,102,788
252 AS	4,102,789
293	4,102,790
326	4,102,791
457	4,102,792

CLASS 211

4	4,102,458

CLASS 213

112	4,102,459

CLASS 214

6 C	4,102,460
132	4,102,461
301	4,102,462
671	4,102,463
750	4,102,464

CLASS 219

69 W	4,103,137
76.11	4,103,138
101	4,103,139
125.11	4,103,140
130.01	4,103,141
136	4,103,142
145.21	4,103,143
209	4,103,144
222	4,103,145
368	4,103,146
524	4,103,147

CLASS 220

3	4,102,465
3.8	4,102,466
22.3	4,102,470
67	4,102,467
69	4,102,468
89 A	4,102,469
242	4,102,471
295	4,102,472
319	4,102,473
323	4,102,474
366	4,102,475

CLASS 222

193	Re.29,707
209	4,102,476
438	4,102,477
465	Re.29,708

CLASS 223

99	4,102,478
101	4,102,479
	4,102,480

CLASS 228

6 R	4,102,481
170	4,102,482
244	4,102,483

CLASS 229

16 A	4,102,484
23 R	4,102,485
37 R	4,102,486
54 R	4,102,487
55	4,102,488
73	4,102,489

CLASS 233

26	4,102,490

CLASS 235

92 PC	4,103,148
92 TE	4,103,149
302	4,102,491
375	4,102,492
419	4,102,493
	4,103,150

CLASS 236

1 B	4,102,494
46 R	4,102,495
48 R	4,102,496

CLASS 238

14.8	4,102,497

CLASS 239

265.19	4,102,498
265.27	4,102,499
345	4,102,500
511	4,102,501

CLASS 241

4	4,102,502
18	4,102,503
186 R	4,102,504
297	4,102,505

CLASS 242

18 DD	4,102,506
18 PW	4,102,507
	4,102,508
47.04	4,102,509
55.2	4,102,510
64	4,102,511
66	4,102,512
75.4	4,102,513
199	4,102,514
	4,102,515
	4,102,516
201	4,102,517

CLASS 244

3.11	4,102,521
110 C	4,102,518
125	4,102,519
137 R	4,102,520

CLASS 248

24	4,102,522
49	4,102,523
56	4,102,524
174	4,102,525

CLASS 250

203 R	4,103,151
204	4,103,152
227	4,103,153
	4,103,154
231 SE	4,103,155
236	4,103,156
239	4,103,157
269	4,103,158
315 R	4,103,159
334	4,103,160
336	4,103,161
343	4,103,162
344	4,103,163
374	4,103,164
390	4,103,165
391	4,103,166
432 R	4,103,167
442	4,103,168
445 T	4,103,169
451	4,103,170
458	4,103,171
462	4,103,172
483	4,103,173
493	4,103,174
504	4,103,175
516	4,103,176
562	4,103,177

CLASS 251

139	4,102,526

CLASS 252

8.1	4,102,793
	4,102,794
8.9	4,102,795
47.5	4,102,796
51.5 A	4,102,797
	4,102,798
99	4,102,799
182	4,102,800
	4,102,801
184	4,102,802
188	4,102,803
189	4,102,804
301.4 F	4,102,805
316	4,102,806
	4,102,807
354	4,102,808
408	4,102,809
	4,102,814
408 R	4,102,810
411 R	4,102,811
421	4,102,812
426	4,102,815
428	4,102,816
429 B	4,102,817
430	4,102,813
439	4,102,818
460	4,102,819
463	4,102,820
	4,102,821
465	4,102,822
533	4,102,823
545	4,102,824
547	4,102,825
548	4,102,826

CLASS 254

131	4,102,527
139.1	4,102,528

CLASS 256

70	4,102,529

CLASS 260

4 AR	4,102,834
5	4,102,835
22 CB	4,102,837
	4,102,838
22 TN	4,102,836
23 XA	4,102,839
29.2 TN	Re.29,711
29.4 R	4,102,840
29.6 N	4,102,841
29.6 PT	4,102,842
29.6 RW	4,102,843
29.7 NR	4,102,845
29.7 T	4,102,844
31.2 N	4,102,846
31.4 R	4,102,847
31.6	4,102,848
33.6 AQ	4,102,849
	4,102,850
37 EP	4,102,851
37 SB	4,102,852
40 R	4,102,853
42.18	4,102,854
42.33	4,102,855
42.53	4,102,856
45.8 A	4,102,859
45.8 N	4,102,857
	4,102,858
45.95 E	4,102,861
112.5 R	4,102,877
	4,102,878
149	4,102,879
156	4,102,880
175	4,103,092
239 BD	4,102,881
239.1	4,102,882
239.55 R	4,102,883
239.57	4,102,884
287 CF	4,102,886
290 HL	4,102,887
294.8 D	4,102,888
296 R	4,102,889
307 F	4,102,890
308 R	4,102,891
314.5	4,102,892
326.14 R	4,102,893
332.3 R	4,102,894
340.6	4,102,895
343	4,102,897
	4,102,898
343.6	4,102,896
	4,102,899
	4,102,900
345.3	4,102,902
345.7 R	4,102,903
	4,102,904
345.8 R	4,102,901
346.3	4,102,905
382	4,102,906
397.3	4,102,907
397.4	4,102,908
404	4,102,909
453 RW	4,102,910
458 R	4,102,911
463	4,102,912
465.1	4,102,913
465.3	4,102,914
465.8 D	4,102,915
501.12	4,102,916
506	4,102,917
507 R	4,102,918
520 E	4,102,919
532	4,102,920
	4,102,921
	4,102,922
553 R	4,102,923
562 P	4,102,924
570.6	4,102,925
576	4,102,926
581	4,102,927
586 C	4,102,928
590 FA	4,102,929
593 R	4,102,930
609 B	4,102,931
609 R	4,102,932
613 D	4,102,933
613 R	4,102,934
656 R	4,102,935
	4,102,936

666 P 4,102,937
676 R 4,102,938
683 D 4,102,939
823 4,102,827
824 R 4,102,940
825 4,102,941
836 4,102,942
850 4,102,943
858 4,102,868
861 4,102,944
878 R 4,102,946
879 4,102,945
4,102,947
944 4,102,948
985 4,102,949

CLASS 261
44 A 4,102,952

CLASS 264
3 B 4,102,953
24 4,102,954
25 4,102,955
32 4,102,956
39 4,102,957
40.6 4,102,958
41 4,102,959
42 4,102,960
57 4,102,961
82 4,102,962
91 4,102,963
92 4,102,964
103 4,102,965
112 4,102,966
113 4,102,967
117 4,102,968
147 4,102,969
176 R 4,102,970
255 4,102,971
256 4,102,972
272 4,102,973
294 4,102,974
322 4,102,975

CLASS 266
46 4,102,530

CLASS 270
79 4,102,531

CLASS 273
1 E 4,102,532
73 E 4,102,533
282 4,102,535

CLASS 274
23 R 4,102,536

CLASS 277
153 4,102,538

CLASS 279
114 4,102,539

CLASS 280
5 H 4,102,540
11.1 BT 4,102,541
207 4,102,542

CLASS 283
49 4,102,543

CLASS 285
8 4,102,544

CLASS 290
40 R 4,103,178

CLASS 292
57 4,102,545
346 4,102,546

CLASS 294
1 R 4,102,547

CLASS 296
1 S 4,102,548
102 4,102,537

CLASS 297
383 4,102,549

CLASS 299
11 4,102,550

CLASS 301
37 P Re.29,710

CLASS 303
24 A 4,102,551

CLASS 307
88.3 4,103,179
141 4,103,180
203 4,103,182
214 4,103,183
225 C 4,103,184
238 4,103,185
251 4,103,186
4,103,187
4,103,188
270 4,103,189
362 4,103,190

CLASS 308
4 A 4,102,552
6 C 4,102,553

CLASS 310
49 R 4,103,191
64 4,103,192
68 D 4,103,193
4,103,194
259 4,103,195
266 4,103,196
267 4,103,197

CLASS 312
107 4,102,554
240 4,102,555
250 4,102,556
257 R 4,102,557

CLASS 313
60 4,103,198
101 4,103,199
221 4,103,200
318 4,103,201
336 4,103,202
390 4,103,203
422 4,103,204
4,103,205
513 4,103,206

CLASS 315
3.5 4,103,207
51 4,103,208
207 4,103,209

CLASS 318
46 4,103,210
87 4,103,211
224 A 4,103,212
4,103,213
326 4,103,214
654 4,103,215
685 4,103,216

CLASS 322
28 4,103,217

CLASS 323
1 4,103,218
8 4,103,219
19 4,103,220
92 4,103,221

CLASS 324
57 R 4,103,223
58.5 C 4,103,224
60 CD 4,103,225
61 R 4,103,226
65 R 4,103,227
4,103,228
71 CP 4,103,229
77 H 4,103,230
123 R 4,103,231
158 F 4,103,232
207 4,103,222
208 4,103,233

CLASS 325
38 A 4,103,234
64 4,103,235
132 4,103,236
4,103,237
141 4,103,238
144 4,103,239
349 4,103,240
373 4,103,241

CLASS 328
35 4,103,242
169 4,103,243

CLASS 329
122 4,103,244

CLASS 330
265 4,103,245
278 4,103,246
284 4,103,247
288 4,103,248
4,103,249

CLASS 331
1 A 4,103,250
4,103,251
48 4,103,252
94.5 C 4,103,255
94.5 G 4,103,253
94.5 L 4,103,256
4,103,257
94.5 S 4,103,254
111 4,103,258
117 D 4,103,259

CLASS 332
7.51 4,103,260
4,103,261

CLASS 333
6 4,103,262
30 R 4,103,263
72 4,103,264

CLASS 335
205 4,103,265
289 4,103,266

CLASS 336
65 4,103,267
208 4,103,268

CLASS 337
67 4,103,269
178 4,103,270
372 4,103,271
411 4,103,272

CLASS 338
2 4,103,273
21 4,103,274
25 4,103,275
214 4,103,276
237 4,103,277

CLASS 339
144 R 4,102,558

CLASS 340
1 R 4,103,278
3 D 4,103,279
12 R 4,103,280
18 LD 4,103,281
58 4,103,282
4,103,283
61 4,103,284
65 4,103,285
146.2 4,103,286
146.3 H 4,103,287
152 R 4,103,288
164 R 4,103,289
168 B 4,103,290
309.1 4,103,296
324 M 4,103,297
331 4,103,298
506 4,103,299
514 4,103,293
522 4,103,291
566 4,103,294
572 4,103,295
603 4,103,292

CLASS 343
6 R 4,103,300
7.7 4,103,301
9 4,103,302
100 SA 4,103,303
113 R 4,103,304
715 4,103,305

CLASS 346
153 4,103,306

CLASS 350
96.18 4,102,559
96.19 4,102,560
96.21 4,102,561
105 4,102,562

CLASS 351
7 4,102,563
4,102,564
14 4,102,565
131 4,102,566
160 4,102,567

CLASS 353
28 4,102,568
120 4,102,569

CLASS 354
23 D 4,103,307
4,103,308
25 4,103,309
120 4,103,310
152 4,103,311

CLASS 355
16 4,102,570

CLASS 356
1 4,102,571
5 4,102,572
86 4,102,573
101 4,102,576
117 4,102,574
120 4,102,578
125 4,102,575
169 4,102,577
201 4,102,579
210 4,102,580
225 4,102,581
241 4,102,582

CLASS 357
16 4,103,312

CLASS 360
70 4,103,313
78 4,103,314
110 4,103,315

CLASS 361
3 4,103,316
31 4,103,317
86 4,103,181
106 4,103,319
215 4,103,320
388 4,103,318
4,103,321

CLASS 362
71 4,102,712
101 4,103,322
306 4,103,323

CLASS 363
22 4,103,356
89 4,103,324
148 4,103,325

CLASS 364
200 4,103,326
4,103,327
4,103,328
4,103,329
4,103,330
4,103,331
449 4,103,332
824 4,103,333
900 4,103,334
4,103,335
4,103,336
4,103,337
4,103,338

CLASS 365
1 4,103,339
97 4,103,340
117 4,103,341
149 4,103,342
183 4,103,343
184 4,103,344
190 4,103,345
216 4,103,346
219 4,103,347
228 4,103,348
231 4,103,349

CLASS 366
22 4,103,350
30 4,103,351
39 4,103,352
81 4,103,353
88 4,103,354
90 4,103,355
152 4,103,357
153 4,103,358

CLASS 401
259 4,102,584

CLASS 403
138 4,102,585
188 4,102,586
205 4,102,587
245 4,102,588
373 4,102,589

CLASS 404
110 4,102,590

CLASS 407
25 4,102,583
100 4,102,591

CLASS 408
46 4,102,592
130 4,102,593
186 4,102,594

CLASS 415
1 4,102,595
101 4,102,596
4,102,597
135 4,102,598
212 R 4,103,063
219 R 4,102,599

CLASS 416
91 4,102,600
183 4,102,601
221 4,102,602
244 A 4,102,603

CLASS 417
19 4,102,604
98 4,102,605
204 4,102,606
222 4,102,607
242 4,102,608
399 4,102,609
417 4,102,610
469 4,102,611
477 4,102,612
516 4,102,613

CLASS 418
59 4,102,614
86 4,102,615
91 4,102,616
142 4,102,617

CLASS 423
87 4,102,976
118 4,102,977
239 4,102,980
240 4,102,981
242 4,102,982
245 4,102,983
301 4,102,984
350 4,102,985
402 4,102,986
466 4,102,987
483 4,102,988
541 R 4,102,989
579 4,102,950
594 4,102,951
626 4,102,978

CLASS 424
1 4,102,979
12 4,102,990
27 4,102,991
49 4,102,992
54 4,102,993
4,102,994
81 4,102,995
89 4,102,996
115 4,102,997
4,102,998
123 4,102,999
133 4,103,000
148 4,103,001
177 4,103,003
4,103,004
4,103,005
181 4,103,006
244 4,103,007
246 4,103,008
249 4,103,009
250 4,103,010
251 4,103,011
263 4,103,012
4,103,013
267 4,103,014
269 4,103,015
270 4,103,016
4,103,017
272 4,103,018
274 4,103,019
4,103,020
278 4,103,021
4,103,022
279 4,103,023
285 4,103,024
305 4,103,025
4,103,026
309 4,103,027
315 4,103,028
318 4,103,029
330 4,103,030
337 4,103,031
341 4,103,032
343 4,103,033

CLASS 425
64 4,102,618
89 4,102,619
147 4,102,620
224 4,102,621
268 4,102,622
393 4,102,623
429 4,102,624
464 4,102,625
526 4,102,626

CLASS 426
250 4,103,034
321 4,103,035
538 4,103,036
575 4,103,037
601 4,103,038
607 4,103,039
614 4,103,040

CLASS 427
2 4,103,041
38 4,103,042
49 4,103,043
56 4,103,044
82 4,103,045
113 4,103,046
178 4,102,869
191 4,102,678
242 4,103,047
248 R 4,103,048
341 4,103,049
379 4,103,050
394 4,103,051

CLASS 428
38 4,103,052
40 4,103,053
91 4,103,054
113 4,103,055
142 4,103,056
155 4,103,002
156 4,103,057
171 4,103,058
178 4,103,059
241 4,103,060
247 4,103,061
283 4,103,062
333 4,103,064
336 4,103,065
337 4,103,066
387 4,103,067
395 4,103,068
403 4,103,069
412 4,103,070
421 4,103,071
425 4,103,072
474 4,103,073
614 4,103,075
653 4,103,076

CLASS 431
16 4,102,627
20 4,102,629
29 4,102,630
43 4,102,628
152 4,102,633
253 4,102,631
298 4,102,634

CLASS 432
3 4,102,632
14 4,102,635
30 4,102,636
227 4,102,637
229 4,102,638

CLASS 521
81 4,102,829
99 4,102,831
103 4,102,832
159 4,102,833
165 4,102,830
174 4,102,828

CLASS 526
19 4,102,876
51 4,103,077
115 4,103,078
185 4,103,079
303 4,103,080
323.1 4,103,081

CLASS 528
18 4,102,860
73 4,102,870
88 4,102,862
111 4,102,863
135 4,102,866
173 4,102,864
215 4,102,865
289 4,102,867
324 4,102,871
331 4,102,873
362 4,102,872
387 4,102,874
388 4,102,875
487 4,103,074

CLASS 536
17 4,103,082

CLASS 542
427 4,103,083

CLASS 544
22 4,103,084
27 4,103,085
47 4,103,086
78 4,103,087
190 4,103,088
283 4,102,885

CLASS 548
344 4,103,089

CLASS 560
3 4,103,090
106 4,103,091
205 4,103,093
231 4,103,094
252 4,103,095

CLASS 568
783 4,103,096
807 4,103,097
838 4,103,098

CLASSIFICATION OF DESIGNS

D2—	27	248,596		17	248,613		121	248,629		30	248,647		18	248,664		5 SS	248,680
	272	248,597		23	248,614	D11—	94	248,631		40	248,648		33	248,665			248,681
D3—	19 E	248,598		82	248,615		131	248,632		53	248,649		36	248,666		15 AD	248,687
D6—	8	248,599		303	248,616		155	248,633		66	248,650		38	248,667			248,688
	31	248,600		313	248,624	D12—	111	248,634		69	248,651		41	248,668		15 AJ	248,682
	47	248,601		337	248,617		125	248,635		70	248,652		99	248,669		15 AM	248,683
	63	248,602		339	248,625		155	248,636		95	248,653	D25—	72	248,670		15 C	248,684
	68	248,603		395	248,618			248,637	D15—	12	248,654	D27—	7	248,673		15 DD	248,686
	97	248,604	D9—	149	248,619		182	248,638		15	248,655		03	248,671		15 PP	248,685
	232	248,605		182	248,620		196	248,639		52	248,656		05	248,672	D48—	2	248,689
D7—	128	248,606		219	248,621		207	248,640			248,657	D28—	9	248,674		32 A	248,690
		248,607		253	248,622	D13—	17	248,641		114	248,658		78	248,675		32 R	248,691
	137	248,608			248,623			248,642		139	248,659	D31—	24	248,676	D52—	3 R	248,692
	152	248,609	D10—	2	248,626			248,643	D16—	33	248,660			248,677			248,693
	187	248,610		46	248,627		18	248,644	D19—	36	248,661	D34—	2 A	248,678	D56—	2	248,694
	194	248,611		75	248,628			248,645	D24—	8	248,662		5 CT	248,679	D64—	11 B	248,695
D8—	13	248,612		112	248,630	D14—	17	248,646		10	248,663						

CLASSIFICATION OF PLANTS

P.—	11	4,283		19	4,284		38	4,285									

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,102,988		4,102,189		4,103,033		4,102,734		4,102,096		4,102,154
4 :	4,102,039		4,102,481		4,103,066		4,102,738		4,102,108		4,102,214
	4,102,346		4,103,267		4,103,109		4,102,770		4,102,129		4,102,442
	4,103,325	06 :	4,101,986		4,103,111		4,102,790		4,102,150		4,102,451
6 :	4,101,981		4,101,995		4,103,115		4,102,894		4,102,164		4,102,482
	4,102,019		4,101,997		4,103,118		4,103,063		4,102,194		4,102,669
	4,102,028		4,102,002		4,103,125		4,103,081		4,102,222		4,102,680
	4,102,053		4,102,009		4,103,145		4,103,101		4,102,250		4,102,779
	4,102,071		4,102,015		4,103,147		4,103,132		4,102,251		4,102,902
	4,102,074		4,102,036		4,103,151		4,103,198		4,102,256		4,102,912
	4,102,125		4,102,067		4,103,166	10 :	4,101,989		4,102,258		4,102,934
	4,102,136		4,102,076		4,103,174		4,102,673		4,102,282		4,103,052
	4,102,176		4,102,095		4,103,207		4,102,801		4,102,316		4,103,119
	4,102,220		4,102,142		4,103,225		4,102,831		4,102,340		4,103,261
	4,102,243		4,102,159		4,103,243		4,102,955		4,102,350	19 :	4,102,041
	4,102,249		4,102,166		4,103,254		4,103,317		4,102,364		4,102,062
	4,102,268		4,102,175		4,103,257	11 :	4,102,575		4,102,367		4,102,131
	4,102,377		4,102,186		4,103,260	12 :	4,102,049		4,102,394		4,102,153
	4,102,392		4,102,247		4,103,263		4,102,077		4,102,425		4,102,540
	4,102,411		4,102,263		4,103,291		4,102,086		4,102,464		4,102,544
	4,102,440		4,102,287		4,103,297		4,102,107		4,102,473		4,102,604
	4,102,467		4,102,290		4,103,301		4,102,156		4,102,475		4,102,989
	4,102,470		4,102,296		4,103,303		4,102,160		4,102,524	20 :	4,102,121
	4,102,490		4,102,330		4,103,305		4,102,211		4,102,534		4,102,260
	4,102,516		4,102,354		4,103,315		4,102,252		4,102,545		4,102,261
	4,102,525		4,102,356		4,103,318		4,102,292		4,102,554		4,102,264
	4,102,532		4,102,370		4,103,319		4,102,324		4,102,583		4,102,272
	4,102,572		4,102,375		4,103,326		4,102,359		4,102,586		4,102,307
	4,102,582		4,102,387		4,103,336		4,102,445		4,102,606		4,103,091
	4,102,607		4,102,396		4,103,338		4,102,497		4,102,646	21 :	4,102,113
	4,102,861		4,102,410		4,103,346		4,102,519		4,102,723		4,102,161
	4,102,987		4,102,465		4,103,349		4,102,810		4,102,728		4,102,162
	4,103,042		4,102,468	08 :	4,102,329		4,103,002		4,102,730		4,102,274
	4,103,144		4,102,479		4,102,397		4,103,107		4,102,747		4,102,349
	4,103,189		4,102,501		4,102,424		4,103,140		4,102,769		4,102,391
	4,103,256		4,102,558		4,102,434		4,103,202		4,102,776		4,102,556
	4,103,284		4,102,574		4,102,533		4,103,234		4,102,811		4,102,660
	4,103,293		4,102,613		4,102,655		4,103,279		4,102,821		4,103,092
	4,103,324		4,102,624		4,103,182		4,103,286		4,102,974	22 :	4,102,777
	4,103,330		4,102,638		4,103,214	13 :	4,102,030		4,103,062		4,102,818
	4,103,331		4,102,754		4,103,327		4,102,259		4,103,072		4,102,923
8 :	4,102,085		4,102,773	09 :	4,102,011		4,102,512		4,103,120	23 :	4,102,141
	4,102,513		4,102,796		4,102,029		4,103,353		4,103,121		4,102,642
	4,103,152		4,102,815		4,102,065	15 :	4,102,412		4,103,129	24 :	Re.29,711
9 :	4,102,196		4,102,822		4,102,165		4,103,004		4,103,133		4,101,994
	4,102,234		4,102,827		4,102,174	17 :	Re.29,708		4,103,134		4,102,188
	4,102,242		4,102,856		4,102,178		4,102,005		4,103,231		4,102,195
	4,102,542		4,102,950		4,102,209		4,102,013		4,103,270		4,102,207
	4,102,753		4,102,981		4,102,277		4,102,038		4,103,310		4,102,241
01 :	4,102,580		4,102,982		4,102,428		4,102,066		4,103,322		4,102,270
	4,103,268		4,102,984		4,102,439		4,102,068	18 :	4,102,060		4,102,327
02 :	4,103,176		4,103,005		4,102,569		4,102,069		4,102,114		4,102,417
04 :	4,102,117		4,103,021		4,102,657		4,102,070		4,102,124		4,102,873

4,102,953
4,103,001
4,103,064
4,103,073
4,103,090
4,103,180
4,103,223
4,103,250
4,103,304
4,103,341
4,103,344
4,103,348
25 : Re.29,707
4,101,992
4,102,093
4,102,112
4,102,180
4,102,203
4,102,325
4,102,345
4,102,416
4,102,455
4,102,476
4,102,526
4,102,543
4,102,546
4,102,550
4,102,566
4,102,567
4,102,581
4,102,603
4,102,605
4,102,641
4,102,684
4,102,703
4,102,758
4,102,759
4,102,819
4,103,061
4,103,124
4,103,175
4,103,251
4,103,255
4,103,277
4,103,282
4,103,306
4,103,309
26 : Re.29,710
4,102,032
4,102,035
4,102,042
4,102,044
4,102,182
4,102,244
4,102,266
4,102,310
4,102,311
4,102,314
4,102,315
4,102,358
4,102,393
4,102,472
4,102,527
4,102,585
4,102,592
4,102,629
4,102,636
4,102,653
4,102,685
4,102,775
4,102,804
4,102,897
4,102,898
4,102,899
4,102,900
4,102,907
4,102,968
4,102,975
4,103,027
4,103,029
4,103,035
4,103,097
4,103,098
4,103,337
27 : 4,102,045
4,102,084
4,102,092
4,102,201
4,102,212
4,102,319
4,102,344
4,102,402
4,102,403
4,102,419
4,102,536
4,102,562
4,102,623
4,102,716
4,102,721
4,102,835
4,103,056
4,103,060
4,103,273
4,103,340
28 : 4,102,380
29 : 4,101,993
4,102,055
4,102,118
4,102,152
4,102,285
4,102,334
4,102,469
4,102,590
4,102,816
4,102,864
4,102,903
4,103,157
4,103,212
4,103,213
30 : 4,102,528
4,102,609
31 : 4,102,406
4,102,523
4,102,748
4,103,235
4,103,241
33 : 4,102,275
4,102,414
4,102,833
34 : 4,102,010
4,102,103
4,102,106
4,102,171
4,102,202
4,102,286
4,102,297
4,102,331
4,102,360
4,102,405
4,102,432
4,102,488
4,102,491
4,102,492
4,102,529
4,102,560
4,102,661
4,102,663
4,102,683
4,102,741
4,102,744
4,102,746
4,102,761
4,102,763
4,102,780
4,102,784
4,102,789
4,102,798
4,102,799
4,102,869
4,102,876
4,102,882
4,102,895
4,102,909
4,102,925
4,102,928
4,102,929
4,102,930
4,102,979
4,102,993
4,102,994
4,102,997
4,103,013
4,103,018
4,103,034
4,103,036
4,103,043
4,103,075
4,103,079
4,103,086
4,103,088
4,103,094
4,103,095
4,103,102
4,103,104
4,103,114
4,103,126
4,103,183
4,103,185
4,103,188
4,103,200
4,103,204
4,103,205
4,103,215
4,103,219
4,103,228
4,103,237
4,103,246
4,103,262
4,103,264
4,103,265
4,103,287
4,103,289
35 : 4,103,199
36 : 4,101,991
4,101,999
4,102,026
4,102,027
4,102,072
4,102,148
4,102,200
4,102,221
4,102,225
4,102,226
4,102,235
4,102,239
4,102,254
4,102,283
4,102,305
4,102,317
4,102,320
4,102,321
4,102,337
4,102,353
4,102,376
4,102,433
4,102,466
4,102,471
4,102,494
4,102,511
4,102,549
4,102,561
4,102,564
4,102,650
4,102,656
4,102,659
4,102,664
4,102,681
4,102,682
4,102,686
4,102,687
4,102,689
4,102,749
4,102,756
4,102,805
4,102,814
4,102,848
4,102,850
4,102,852
4,102,862
4,102,865
4,102,885
4,102,905
4,102,916
4,102,917
4,102,918
4,102,941
4,102,958
4,102,963
4,102,990
4,102,991
4,102,995
4,103,028
4,103,040
4,103,053
4,103,096
4,103.167
4,103,170
4,103,195
4,103,249
4,103,274
4,103,302
4,103,312
4,103,342
4,103,343
37 : 4,103,358
4,102,043
4,102,081
4,102,418
4,102,621
4,102,727
4,102,729
4,102,867
4,103,000
4,103,020
38 : 4,102,745
39 : 4,102,007
4,102,008
4,102,024
4,102,094
4,102,099
4,102,105
4,102,130
4,102,173
4,102,199
4,102,213
4,102,219
4,102,302
4,102,322
4,102,373
4,102,383
4,102,384
4,102,385
4,102,427
4,102,431
4,102,443
4,102,496
4,102,591
4,102,595
4,102,706
4,102,710
4,102,731
4,102,737
4,102,817
4,102,841
4,102,849
4,102,855
4,102,868
4,102,872
4,102,935
4,102,936
4,102,943
4,102,947
4,102,971
4,102,978
4,103,016
4,103,031
4,103,050
4,103,065
4,103,067
4,103,074
4,103,077
4,103,146
4,103,171
4,103,201
4,103,238
4,103,266
4,103,269
4,103,276
4,103,283
4,103,292
4,103,294
40 : 4,102,054
4,102,167
4,102,179
4,102,187
4,102,295
4,102,453
4,102,627
4,102,802
4,102,875
4,102,937
4,102,939
4,102,954
4,102,967
4,103,177
4,103,335
41 : 4,101,996
4,102,224
4,102,236
4,102,318
4,102,347
4,102,478
42 : Re.29,706
4,102,014
4,102,034
4,102,102
4,102,133
4,102,135
4,102,151
4,102,190
4,102,192
4,102,193
4,102,227
4,102,233
4,102,245
4,102,248
4,102,323
4,102,332
4,102,389
4,102,390
4,102,436
4,102,437
4,102,449
4,102,484
4,102,495
4,102,547
4,102,598
4,102,620
4,102,637
4,102,645
4,102,662
4,102,676
4,102,677
4,102,698
4,102,702
4,102,707
4,102,713
4,102,722
4,102,739
4,102,752
4,102,760
4,102,764
4,102,765
4,102,766
4,102,767
4,102,774
4,102,800
4,102,808
4,102,809
4,102,843
4,102,851
4,102,863
4,102,877
4,102,888
4,102,889
4,102,914
4,102,919
4,102,920
4,102,921
4,102,931
4,102,932
4,102,960
4,102,985
4,102,996
4,102,998
4,103,048
4,103,059
4,103,069
4,103,070
4,103,076
4,103,093
4,103,106
4,103,122
4,103,130
4,103,141
4,103,178
4,103,203
4,103,209
4,103,211
4,103,226
4,103,227
4,103,296
44 : 4,102,058
4,102,308
45 : 4,102,644
4,102,667
4,102,964
4,103,051
46 : 4,103,123
47 : 4,102,017
4,102,262
4,102,510
4,103,350
48 : 4,102,047
4,102,052
4,102,075
49 : 4,102,240
4,102,352
4,102,374
4,102,632
4,103,003
50 : 4,102,269
4,103,135
51 : 4,102,059
4,102,089
4,102,149
4,102,415
4,102,504
4,102,557
4,102,714
4,102,733
4,102,942
4,103,068
4,103,161
4,103,229
53 : 4,102,031
4,102,232
4,102,278
4,102,548
4,102,622
4,102,735
4,103,148
4,103,165
4,103,216
4,103,352
54 : 4,102,678
55 : 4,102,023
4,102,098
4,102,111
4,102,326
4,102,366
4,102,382
4,102,430
4,102,444
4,102,448
4,102,456
4,102,457
4,102,489
4,102,555
4,102,615
4,103,006
4,103,038
4,103,058
4,103,127
4,103,136
4,103,299
56 : 4,102,073

4	:	248,668	248,613	09	:	248,676	21	:	248,635	248,619	248,659
6	:	248,615	248,622			248,681	24	:	248,667	248,625	248,669
		248,616	248,623	12	:	248,600			245,671	248,637	42 : 248,612
		248,632	248,626			248,634			248,672	248,660	248,670
		248,662	248,628			248,658	25	:	248,633	36 : 248,668	248,677
		248,685	248,638	17	:	248,629	26	:	248,648	248,617	44 : 248,631
9	:	248,687	248,639			248,630			248,678	248,679	47 : 248,596
		248,688	248,647			248,646	27	:	248,644	248,680	248,602
06	:	248,598	248,650			248,655			248,645	248,686	48 : 248,636
		248,599	248,651			248,666			248,692	37 : 248,603	248,665
		248,601	248,661			248,674	32	:	248,656	248,627	51 : 248,641
		248,605	248,673			248,690			248,657	248,663	248,642
		248,610	248,693	18	:	248,618	34	:	248,609	39 : 248,654	248,643

PLANT PATENTS

06	:	4,283	4,284	27	:	4,285					

U. S. GOVERNMENT PRINTING OFFICE : O - 1978

Mail t

Superi
Goverm
Washin

SUBS
ENTE

@ $

PLEA

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE

Juanita M. Kreps, *Secretary*

PATENT AND TRADEMARK OFFICE

Donald W. Banner, *Commissioner*